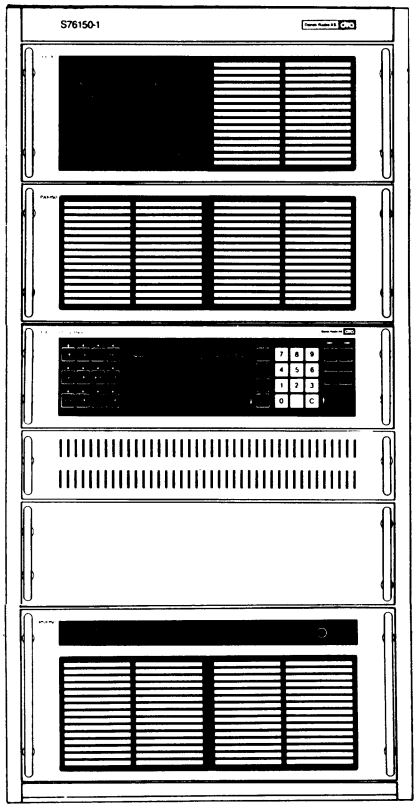
Technical Manual

S76150-1
HF SSB/ISB Communications Transmitter



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1	TRANSMITTER	S 76150-1
2	CABINET RACK	CS 6150
3	POWER AMPLIFIER	PA 6150
4	COMBINATION AND FILTER UNIT	CF 6150
5	POWER SUPPLY	PS 6151 (PS 6150)

C O N T E N T S

TECHNICAL SPECIFICATION: S76150-1 TRANSMITTER

General

The HF SSB/ISB transmitter S76150-1 is a high performance synthesized radio communications transmitter for telephony and telegraphy.

The transmitter consists in the basic version of four 19" drawer panels and a rigid cabinet rack. These panels are the synthex (synthesized exciter) SE4010, the power supply panels PS6150/ PS6151, the power amplifier panels PA6150 and the combination and filter panel CF6150.

The cabinet rack is designed to further accept a control panel AT6211 for an automatic antenna coupler which can be supplied to extend the versatility of the transmitter.

The transmitter covers the frequency range 1.5 MHz to 30 MHz in 10 Hz steps. It offers a choice of upper and lower sideband, independent sideband and radio telegraphy as well as radio teleprinter operation.

The solid state linear power amplifier is designed to provide very high reliability and consists of a number of independent modules, the outputs of which are combined in a hybrid network before being fed to a filter unit and from there to a wide-band antenna or to an automatic antenna coupler which matches a wide variety of whip and long-wire antennas over the whole frequency range to the required 50 ohm transmitter load.

The transmitter is fully controlled by the synthex which selects the frequency, the mode, and the power level by keyboards and controls the harmonic rejection output filters and the switching out of faulted PA modules during service, without any interruption in the transmission only with the inevitable power reduction. The transmitter includes an ALC system which ensures that the output power is kept within 1 dB of selected power level except at high SWR, where it performs a necessary reduction in the output power.

Meters are provided on the synthex and combination and filter panels. The possible measurements include output power, reflected power, SWR, current and voltages in the power amplifier panels and signal levels in the synthex panels.

Frequency Ranges

1.5 MHz to 29.9999 MHz in synthesized 10 Hz increments. The transmitting frequency is selected by a frequency keyboard on the front panel and is indicated by a 7-digit LED display.

Frequency Stability

-15 to +50°C : 0.1 ppm
-25 to +55°C : 0.3 ppm
Ageing (after 30 days of power on): < 0.01 ppm/day
: < 0.04 ppm/month
: < 0.1 ppm/year

Types of Emission

SSB version : J3E
R3E
H3E
H2A
F1B
A1A

ISB version : J3E
R3E
H3E
H2A
F1B
A1A
ISB

3 kHz bandwidth.

Output Power

500 W PEP/average +/- 1 dB into 50 ohm unbalanced for SWR = 1:1 to SWR = 1.5:1.

Output Power Levels

0 dB, -3 dB, -6 dB, -12 dB and -18 dB relative to 500 W.

In the 0 dB and -12 dB power level stages, the forward power is further reduced continuously for SWR worse than 1.5:1 (-1 dB at SWR = 2:1 and -6 dB at SWR = 3:1).

In the 0 dB power level stage, the level is further reduced by 3 dB when SWR > 5:1.

Carrier Suppression

H2A, H3E: 6 dB +/-1 dB

R3E, ISB, B9W: 17 dB +/-1 dB

J3E: More than 50 dB, typically 60 dB.

Intermodulation

1.5 MHz to 30 MHz:
Better than 35 dB relative to PEP at maximum output power.
Typically 41 dB relative to PEP at maximum output power.

Hum and Noise (Line Input)

Less than -45 dB relative to PEP in 3 kHz BW.

Spurious Emissions (incl. harmonics)

Less than -45 dB relative to PEP, typically less than -60 dB.

Suppression of Unwanted Sideband

More than +50 dB relative to PEP.

Muting

More than 130 dB below PEP.

Audio Input Levels

Line inputs for USB, LSB and telex:
-30 dBm to +10 dBm into a 600 ohm balanced insulated input.

Return loss more than 26 dB from 250 Hz to 6 kHz.

Microphone inputs for USB and LSB:
2 mV to 0.2 V into 500 ohm.

Audio Frequency Response

Option 02/SSB:
Within 3 dB from 300 Hz to 3400 Hz.

Option 04/SSB:
Within 6 dB from 350 Hz to 2700 Hz.

Option 05/SSB:
Within 3 dB from 300 Hz to 3000 Hz.

Option 06/ISB:
Within 3 dB from 300 Hz to 3400 Hz.

Option 07/ISB:
Within 3 dB from 300 Hz to 3000 Hz.

Audio AGC

An audio input variation of +/- 10 dB relative to an input signal between -20 dBm and 0 dBm at line input will produce a change in the output level of less than +/-0.4 dB.

Keying Input (A1A, H2B)

ON/OFF keying. OFF voltage : 5 V
ON current : 0.3 mA

Keying Speed

50 baud.

Remote Control

All functions via a single telephone line.

Power Supply

50/60 Hz.

Single phase version:
200, 220, 230, 240, 254 V +/-10%.
Optional: 100, 110, 115, 120, 127 V +/-10%.

Three phase version:
350, 380, 400, 415, 440 V +/-10%.
Optional: 200, 220, 230, 240, 254 V +/-10%.

Power Consumption

Max. 2.2 kW. Power factor 0.9.

Cooling System

Forced air-cooling with blower and temperature control in the individual panels.

Climatic Conditions

Operationg temperature	:	-15°C to +55°C.
Storage temperature	:	-40°C to +70°C.
Operating humidity	:	95% at 40°C.
Storage humidity	:	70% (regardless of temperature).

Dimensions and Weight

Width	:	570 mm
Height	:	1005 mm
Depth	:	700 mm
Weight	:	240 kg approx.

SECTION 2. Description

2.1. Mechanical Description

The transmitter consists of up to eight panels, which are housed in a standard 19 inch. cabinet rack. The arrangement of the panels in the cabinet rack is shown below.

Transmitter S76150

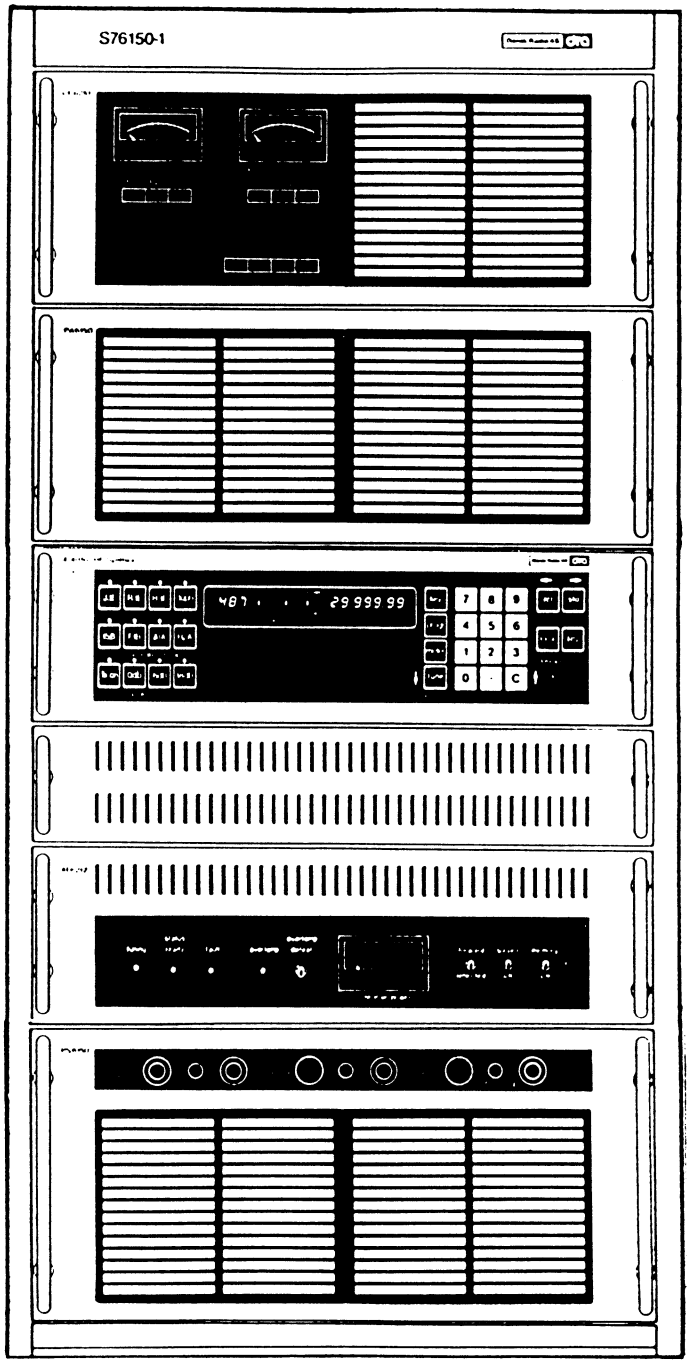
Combination and Filter Unit CF 6150

Power Amplifier PA 6150

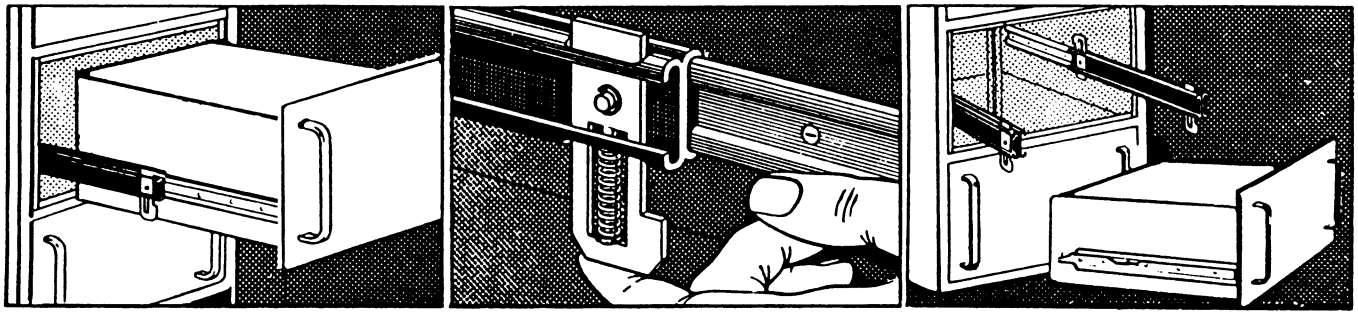
Synthex SE4010

Antenna Tuner Control AT 6210/AT 6212 (Optional)

Power Supply PS 6150 1-phase or PS 6151 3-phase



The panels are designed as drawers (panel-and-chassis assemblies) mounted on telescopic slides. The front panels are fastened to the cabinet rack by means of captive panel-mounting screws. The telescopic slides are fitted with trigger latches which automatically and securely lock the unit in the withdrawn position, when fully extended. The projecting latches are pressed to release the lock so that the drawer can be closed or completely removed from the cabinet rack as shown below. Before removing a drawer from the cabinet all plugs on cables for connecting the unit to the cabinet wiring should be taken out of their sockets at the rear of the chassis.



The panels are connected to one another via flexible cables with plugs which can be removed from the jacks of the panels. External connections to or from the transmitter are made by terminal blocks or jacks at the rear of the transmitter.

All the major panels which need forced air cooling have air-inlet filters at the front. The outlet at the rear of each panel is connected to an air-outlet duct, which in turn has its outlet either via a 200 mm round tube or via a square outlet. The round outlet is used if the cooling air is to be directed out of the building it is housed in, the square one if it is desireable to heat the building with the hot outlet from the transmitter. For dimensions and measures, see Section 4, Installation.

2.2. Electrical Description

2.2.1. Block Diagram, S76150-1: Dwg. No. 496677.

Data and AF signals are applied to the Synthex SE4010. The Synthex is both a synthesizer and exciter, combined. (Hence the name "Synth - ex").

The applied data determines both the mode and frequency of the transmitter.

The output from the synthex at the chosen frequency is fed to a 1:2 splitter, which separates the signal into two equal amplitude and phase signals.

The synthex has a number of control line connections to the combination and filter panel CF 6150. These include a number of control functions from the synthex to the rest of the transmitter and information on the status of the rest of the transmitter is returned to the synthex from the combination and filter panel. The last mentioned are information on the SWR, forward and reflected power and fault lines.

The control lines to the 1:2 splitter consist of two fault lines, so that the input to a faulted 300 W module is switched off.

When the RF signal has been split into two equal parts the two signals are fed to the power amplifier panel PA 6150, which consists of two 300 W modules with separate outputs. The necessary DC power supplies to the power amplifier panel are delivered by the power supply panel PS 6151. The power supply panel also provide AC voltage for the blower in the power amplifier panel.

Control and monitor lines from the power amplifier panel to the combination and filter panel carry a number of control functions from the combination and filter panel to the power amplifier panel, the other way a number of monitoring functions which are current measurements and voltage measurements.

The control lines connecting the combination and filter panel to the power supply panels include a switching-on function and the fault supervisory lines. DC and AC power lines for the combination and filter panel are included.

The two 300 W RF signals are fed to the combination and filter panel, where they are combined into one RF signal. This signal is fed via the filter section of the panel to a directional coupler and further to the antenna jack.

Installations, where the transmitter system includes an automatic antenna tuner, will have Antenna Tuner Control, (AT6211 or AT6212) mounted in the cabinet rack.

An automatic antenna coupler (placed in direct proximity to the antenna) is connected between the cabinet rack's antenna connector and the antenna to ensure that the transmitter's output load requirement of 50 ohms is met.

2.2.2. Interconnection Diagram

2.2.2.1. Cabinet Rack CS 6150 Dwg. No. 210503

Dwg. No. 210503 shows the location and interconnections of transmitter S 76150-1.

The transmitter consists of one power supply panel, PS 6151, which is a three-phase panel on PS6150, which is a single-phase supply, supplying a nominal voltage of 40 V DC to the power amplifier panel, PA 6150.

The synthex, SE 4010 is the heart of the transmitter. Selection of transmitter modes and frequencies is performed from the front panel.

The combination and filter panel, CF 6150, combines and filters the output signal.

The signal path is from the RF output jack os the SE 4010,A4/JL, via the coaxcial cable W113 to the 1:2 splitter J1. The 1:2 splitter is located on the air-outlet duct. The 1:2 splitter delivers two equal amplitude and phase signals to the two 300 W modules of the PA 6150.

The two 300 W outputs from the PA 6150 are taken from J4 and J5 via W108 and W107 to the combination and filter panel. The 500 W output from the combination and filter panel is taken from J1 of this panel.

The AF and key inputs must be connected to J9, which is located at the rear of the transmitter.

Mains connections must be made to terminal board TB1, which is located at the rear of the transmitter.

The RF output jack is a type N connector located at the rear of the transmitter, at the top.

When the transmitter system incorporates an automatic antenna coupler, the control cable from the coupler must be connected to J3, which is located at the rear of the transmitter.

SECTION 4. INSTALLATION

The mounting dimensions of the transmitter are shown in the outline dimentional drawing located at the end of this section. The transmitter should be so located that there is sufficient clearance at each side for free circulation of air and for connecting the output cable and the input cables. A minimum clearance of 300 mm should be left behind the transmitter when it is fitted with a round air-outlet to afford access for the airtube. When the transmitter is fitted with a square outlet a clearance of at least 500 mm should be left behind the transmitter to allow the air to circulate freely.

Sufficient space should also be allowed in front of the transmitter for the panels to be withdrawn and for manipulation of control knobs and reading the meters etc.

While mounting the cabinet rack all the panels should be removed from the cabinet rack, and the side plates should also be removed to give better access to cables and plugs.

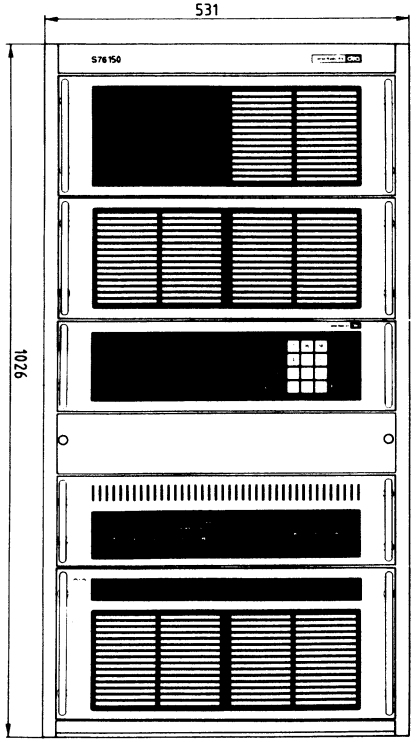
The external cables should be connected to the terminal boards at the rear of the transmitter. LF and key inputs and mains supply are via terminal boards, connections for the antenna coupler and the remote panel are via jacks at the rear of the transmitter.

Then the external connections have been made in accordance with the installation wiring diagram the panels may be inserted again starting from the bottom. When the lower power supply panel has been connected to the cabinet rack wiring the next panel may be inserted and connected etc. When connecting the cables and plugs to the rear of the panels it must be in such a way that the cable is running on top of the roller. If the installation proceeds in this way the work will be easier. When all panels have been installed into the cabinet rack, the side plates and the top plate may be refitted.

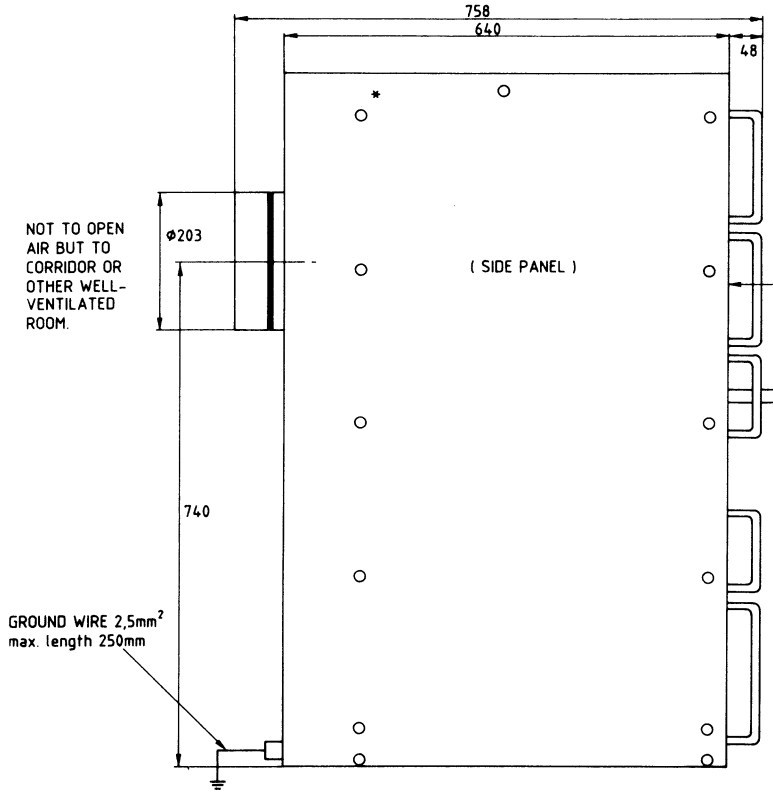
The transmitter without antenna coupler is designed to operate into a 50-ohm load. When the transmitter is fitted with antenna coupler it must be checked in the coupler manual which antenna the coupler will accept.

1.

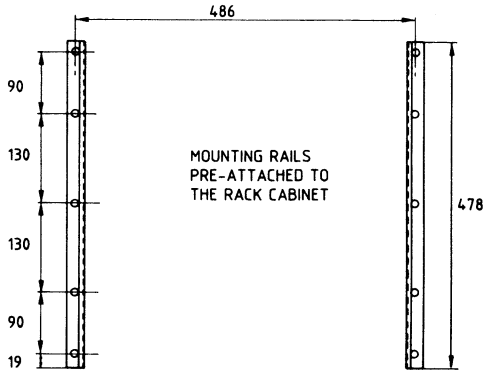
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



FRONT VEIW



SIDE VIEW



* ACCESS TO MOUNTING RAILS IS OBTAINED BY REMOVING ALL MOUNTING SCREWS AT EACH SIDE-PANEL.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075

ANGLES

LIN. DIM.

MATERIAL

DR.	VH	13.3 1989
CH.		
AP.		
AP.		

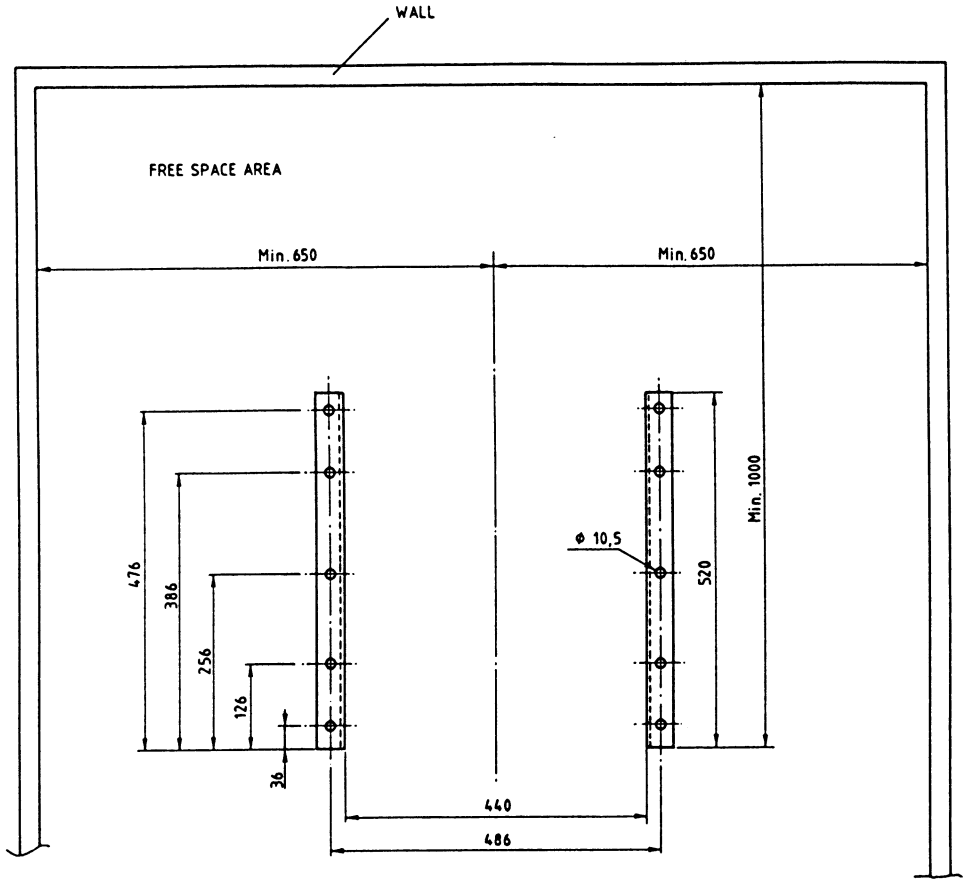
FIRST ANGLE PROJECTION

Dansk Radio AS

TITLE
INSTALLATION DIAGRAM
S76150-1
500W TRANSMITTER RACK

SIZE	CODE IDENT	DRAWING NO.
A2		49 66 50-A
SCALE		SHEET 1 OF 1

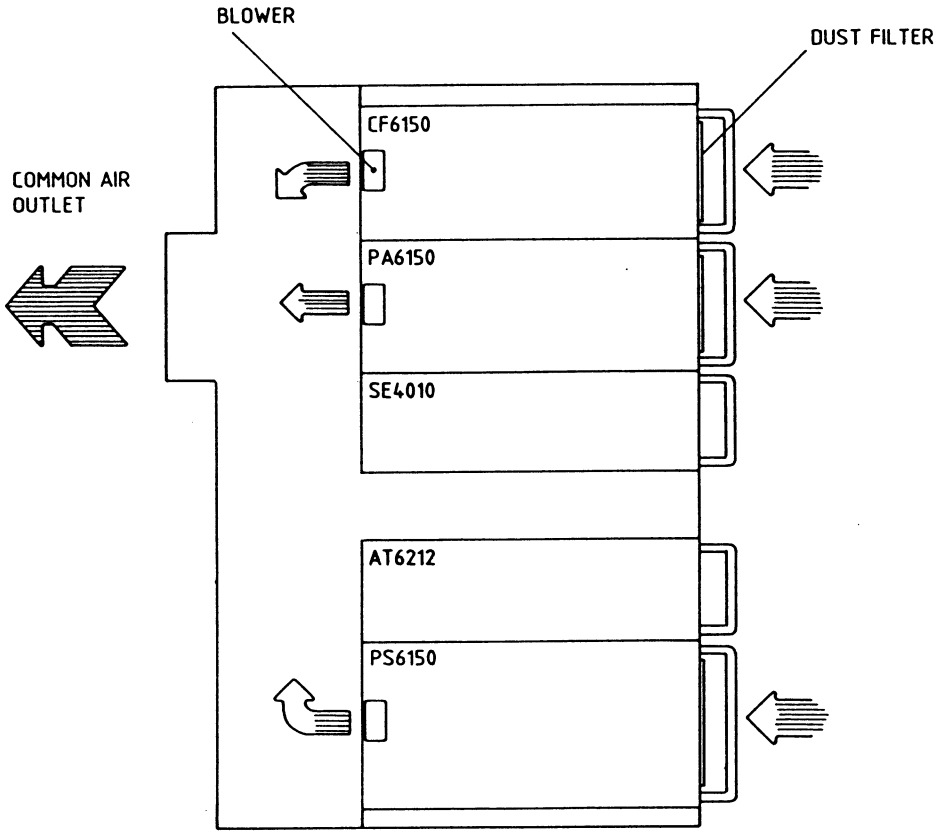
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			
	B	REVISED	7.12.88	VH



All demensions are in mm

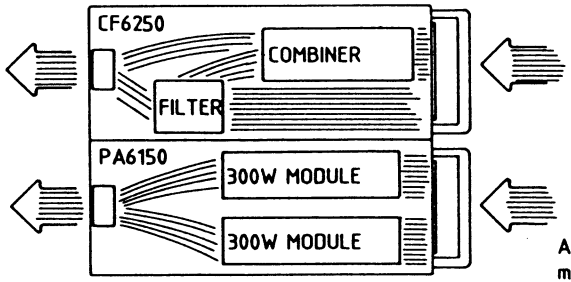
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS	dra
		ANGLES	DR. F.S.P 14-10-83	TITLE Mounting dimensions S76xxx	
		LIN. DIM.	CH.		
			AP.		
		MATERIAL	AP.		
NEXT ASSY	USED ON		FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO PB-1767-2	
APPLICATION				SCALE 1:5	SHEET 1 OF 1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVAL



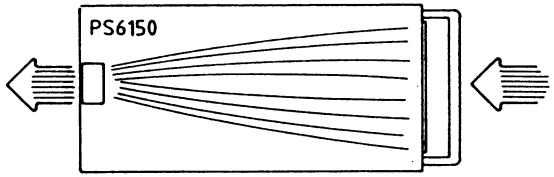
TOTAL AIRCOMSUMP-
TION APPROX 800m^{3}h

FLOW SPEED 7m/sec.



AIRFLOW 165m^{3}h
max. INPUT TEMP. = 55°C

TEMPERATURE RAISE AT OUTPUT
+20°C = max. OUTPUT TEMP. = 75°C



NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 405

ANGLES

LIN DIM

MATERIAL

DR	VH	10.3.89
CH		
AP		
AP		

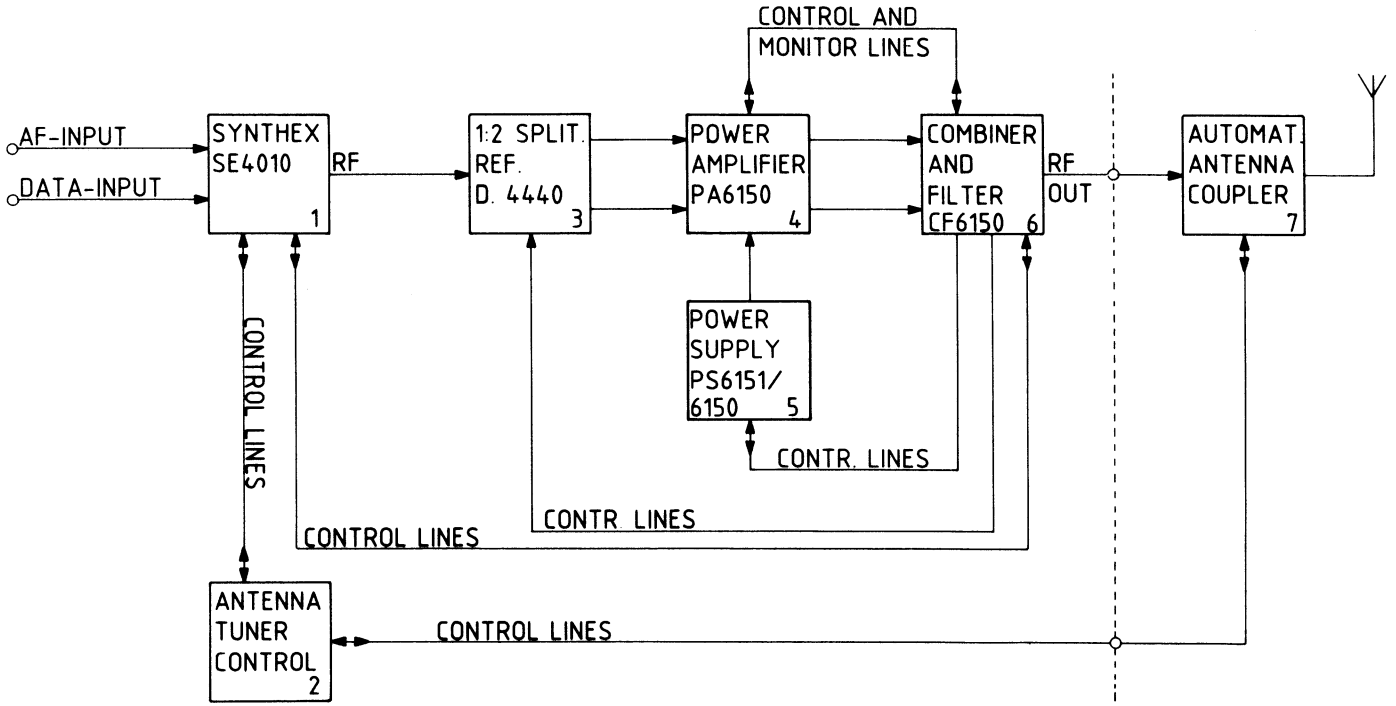
FIRST ANGLE PROJECTION

Dansk Radio AS

TITLE
VENTILATION OUTLINE
TRANSMITTER S76150-1

SIZE	CODE IDENT NO	DRAWING NO
A 3		49 66 69-A
SCALE		SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



NEXT ASSY	USED ON		
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075

ANGLES

LIN. DIM.

MATERIAL

DR.	VH	10.3 1989
CH.		
AP.		
AP.		

FIRST ANGLE PROJECTION

Dansk Radio AS

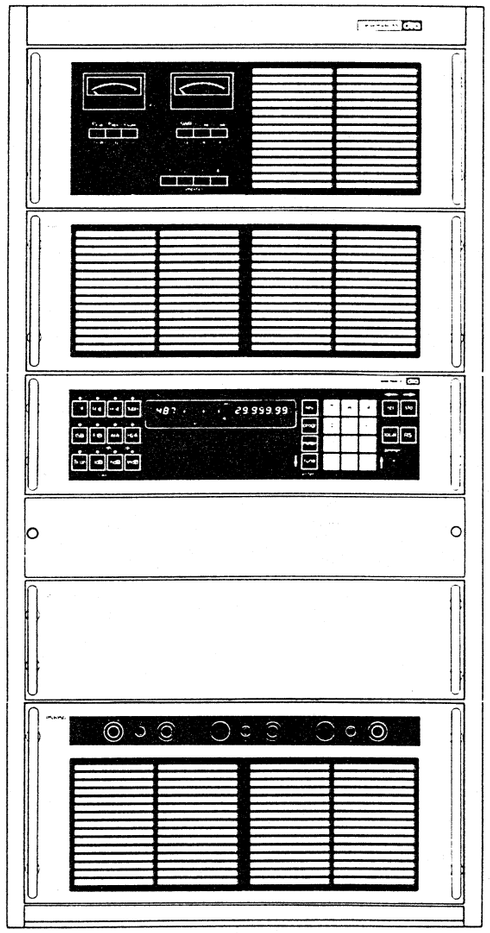
TITLE
CONFIGURATION
TRANSMITTER S76150-1

SIZE	CODE IDENT	DRAWING NO.
A2		49 66 77-A
SCALE		SHEET 1 OF 1

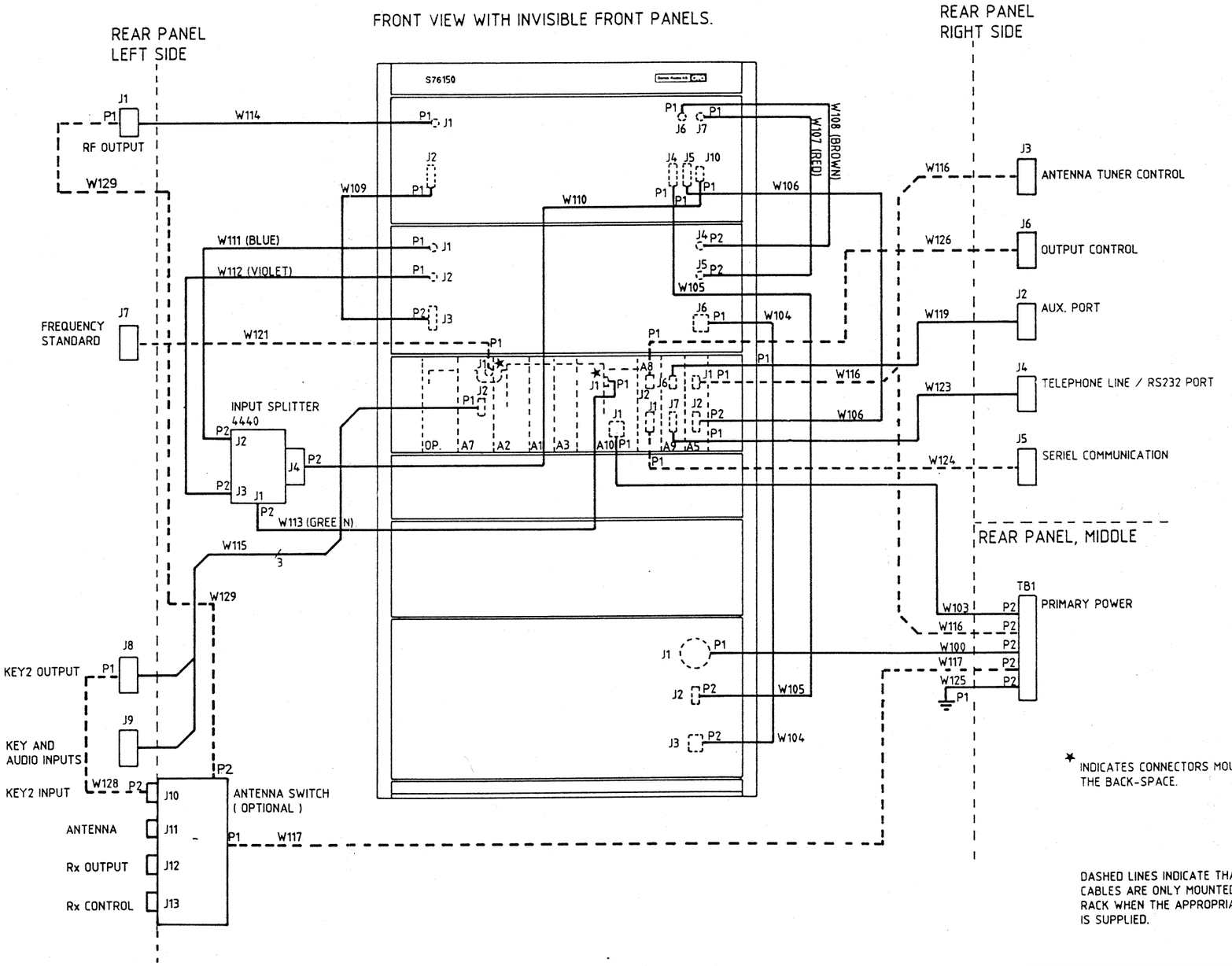
1.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			

NORMAL FRONT VIEW



FRONT VIEW WITH INVISIBLE FRONT PANELS.



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075	
		ANGLES	DR. VH 24.10 1989
		LIN. DIM.	CH. CA 15.11.89
			AP.
	S76150	MATERIAL	AP.
NEXT ASSY	USED ON		FIRST ANGLE PROJECTION
APPLICATION			

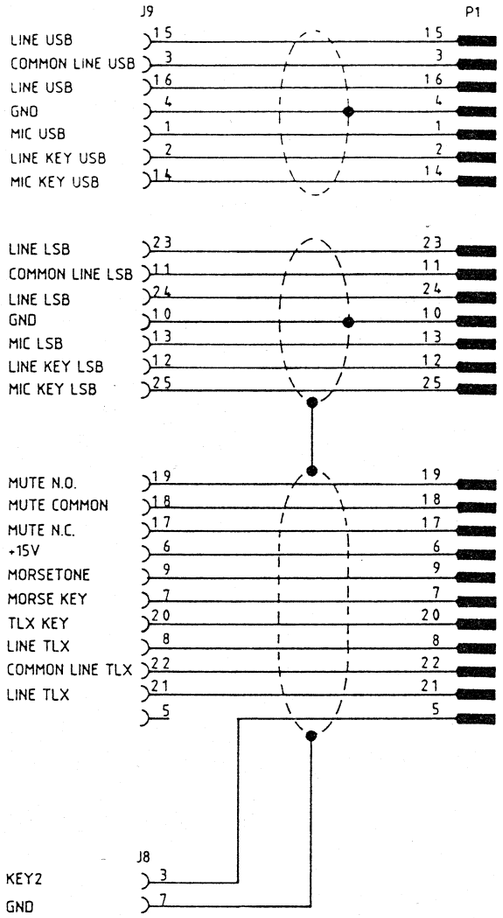
Dansk Radio AS

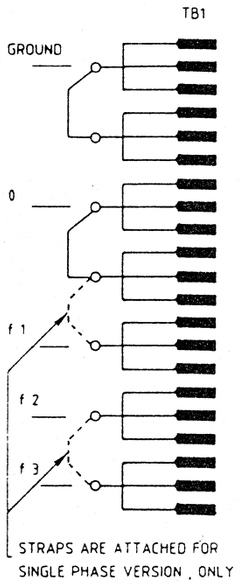
TITLE
INTERCONNECTION DIAGRAM
FOR CABINET RACK
AND PANEL CHASSIS ASSEMBLIES

SIZE	CODE IDENT	DRAWING NO.
A2		210503-PD
SCALE 1:5		SHEET 1 OF 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A			

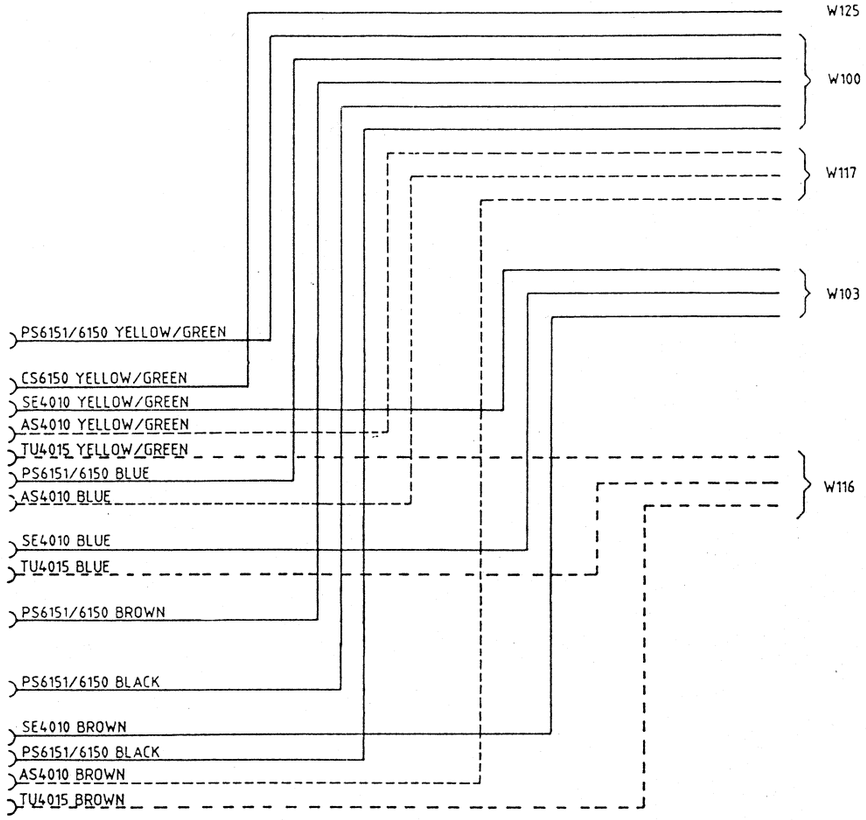
AUDIO AND KEY INPUTS



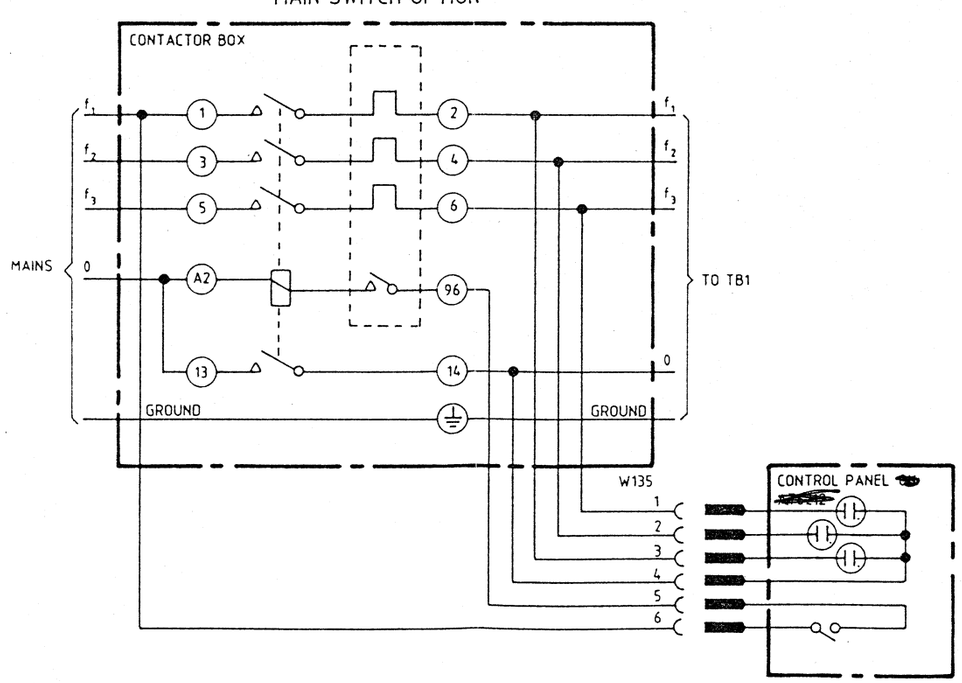


STRAPS ARE ATTACHED FOR SINGLE PHASE VERSION . ONLY

PRIMARY POWER



MAIN SWITCH OPTION



IN ALL OTHER INTERCONNECTION CABLES, FOR WHICH SPECIAL CONNECTION DIAGRAMS ARE NOT SHOWN, THE CONTACTS AT THE ONE END ARE CONNECTED TO THE CONTACT WITH THE SAME CONTACT NUMBER AT THE OTHER END.

DASHED LINES INDICATE THAT THE CABLES ARE ONLY MOUNTED IN THE RACK WHEN THE APPROPRIATE OPTION IS SUPPLIED.

FIRST ANGLE PROJECTION	SIZE	CODE IDENT	DRAWING NO.
	A 2		210503-PD
	SCALE		SHEET 2

TABLE OF CONTENTS

2.2. Electrical Description

2.2.1. Block Diagrams

2.2.1.1. Block Diagram S 76150 Power Amplifier Part (Ref. Designation 4471)

The power amplifier part of the S 76150 consists of 3 panels, i.e. one power amplifier panel called PA 6150 and one power supply panel supplying +40 V DC to the corresponding PA panel. The power supply may be either three-phase units or single-phase units, the former called PS 6151 and the latter PS 6150. The last panel in the power amplifier part of the S 76150 is the combination and filter panel called CF 6150.

Also included in the power amplifier part is the 1:2 splitter which is located in a separate box at the rear of the rack.

In the block diagram each panel is separated by a dashed line.

In the 1:2 splitter the input signal from the synthex is divided into two equal amplitude and phase signals, each feeding a 300-W module in the power amplifier panel. The power amplifier panel consists of two 300-W modules which feed separate signals to the 2:1 500-W output combiner. The 500-W output combiner is part of the CF 6150.

The output from the 300-W modules contains harmonics of the wanted frequency. Therefore a filter bank is included to attenuate these unwanted output components. The second harmonic is attenuated by the low-pass filter. The third harmonic is fed via the high-pass section to a 50-ohm load where it is dissipated.

From the filter bank the signal is sent via a 3-dB attenuator control either directly to the directional coupler or through a 3-dB attenuator. If a mismatch exists at the antenna terminal the signal is routed via the 3-dB attenuator to protect the output transistors.

The directional coupler delivers two signals to the SWR computer, one which is analog to the forward power, one which is analog to the return power.

The standing wave ratio computer calculated the actual SWR which is shown on one of the meters on the CF 6150. The information about the SWR is also fed to the synthex where among other things it is used to operate the 3-dB attenuator control.

The power regulator in the CF 6150 delivers DC to the SWR computer and meter amplifiers.

The blower control, which is built on the same PCB as the 3-dB attenuator control, switches the power off the transmitter in case of blower failure.

2.2.3. Circuit Diagrams

2.2.3.1. 1:2 Splitter. Reference Designation 4440

The 1:2 splitter is mounted on PCB 22180 which in turn is mounted in a shielded box on the air-outlet duct at the rear of the transmitter rack.

The input to 1:2 splitter is at J1. The resistors R1 through R6 form a 3-dB attenuator. This is included to terminate the input into a proper 50-ohm load and to allow using the same synthex as in a 1000 W transmitter.

T1 is transforming the impedance to 25 ohms which is needed at the input of T2, which divide the signal into two parts of equal amplitude and phase. C1, C2 and C5 are high-frequency compensating capacitors. The outputs to the two 300 W modules are taken from J2 and J3 via the relays K1 and K2.

If a fault occurs in one of the 300 W modules, the relays will change over and terminate the transformers into a 50-ohm termination made up of R8, R9 or R10,R11.

SECTION 8. PARTS LISTS AND COMPONENT SPECIFICATIONS.

8.1. Parts Lists.

This section gives for each module all components used. The parts lists are arranged in order of module (= diagram) numbers. The components are identified by their DRA code numbers.

REFERENCE DESIGNATIONS

A . . . . . assembly
AT . . attenuator; isolator; termination
B . . . . . fan; motor
BT . . . . . battery
C . . . . . capacitor
CP . . . . . coupler
CR . . . . . diode; diode thyristor; varactor
DC . . . directional coupler
DL . . . . . delay line
DS . . . . . annunciator; signaling device (audible or visual); lamp; LED
E . . . . . miscellaneous electrical part
F . . . . . fuse
FL . . . . . filter
H . . . . . hardware
HY . . . . . circulator
J . . . electrical connector (stationary portion); jack
K . . . . . relay
L . . . . . coil; inductor
M . . . . . meter
MP . . . . . miscellaneous mechanical part
P . . . electrical connector (movable portion); plug
Q . . . . . transistor; SCR; triode thyristor
R . . . . . resistor
RT . . . . . thermistor
S . . . . . switch
T . . . . . transformer
TB . . . . . terminal board
TC . . . . . thermocouple
TP . . . . . test point
U . . . . . integrated circuit; microcircuit
V . . . . . electron tube
VR . . . . voltage regulator; breakdown diode
W . . . . cable; transmission path; wire
X . . . . . socket
Y . . . . crystal unit (piezoelectric or quartz)
Z . . . . tuned cavity; tuned circuit

ABBREVIATIONS

A . . . . . ampere
ac . . . . alternating current
ACCESS . . . . . accessory
ADJ . . . . . adjustment
A/D . . . . analog-to-digital
AF . . . . . audio frequency
AFC . . . . . automatic frequency control
AGC . . . . . automatic gain control
AL . . . . . aluminum
ALC . . . . . automatic level control
AM . . . amplitude modulation
AMPL . . . . . amplifier
APC . . . . automatic phase control
ASSY . . . . . assembly
AUX . . . . . auxiliary
avg . . . . . average
AWG . . . . American wire gauge
BAL . . . . . balance
BCD . . . . . binary coded decimal
BD . . . . . board
BE CU . . . . . beryllium copper
BFO . . . . . beat frequency oscillator
BH . . . . . binder head
BKDN . . . . . breakdown
BP . . . . . bandpass
BPF . . . . . bandpass filter
BRS . . . . . brass
BWO . . . . . backward-wave oscillator
CAL . . . . . calibrate
ccw . . counter-clockwise
CER . . . . . ceramic
CHAN . . . . . channel
cm . . . . . centimeter
CMO . . cabinet mount only
COAX . . . . . coaxial
COEF . . . . . coefficient
COM . . . . . common
COMP . . . . . composition
COMPL . . . . . complete
CONN . . . . . connector
CP . . . . . cadmium plate
CRT . . . cathode-ray tube
CTL . . . . complementary transistor logic
CW . . . . . continuous wave
cw . . . . . clockwise
cm . . . . . centimeter
D/A . . . . digital-to-analog
dB . . . . . decibel
dBm . . . . decibel referred to 1 mW
dc . . . . . direct current
deg . . degree (temperature interval or difference)
° . . . . . degree (plane angle)
°C . . . . . degree Celsius (centigrade)
°F . . . . degree Fahrenheit
°K . . . . . degree Kelvin
DEPC . . deposited carbon
DET . . . . . detector
diam . . . . . diameter
DIA . . . diameter (used in parts list)
DIFF AMPL . . differential amplifier
div . . . . . division
DPDT . . . . . double-pole, double-throw
DR . . . . . drive
DSB . . . . double sideband
DTL . . . . diode transistor logic
DVM . . . digital voltmeter
ECL . . . . emitter coupled logic
EMF . . electromotive force
EDP . . . . . electronic data processing
ELECT . . . . . electrolytic
ENCAP . . . . encapsulated
EXT . . . . . external
F . . . . . farad
FET . . . . . field-effect transistor
F/F . . . . . flip-flop
FH . . . . . flat head
FIL H . . . . . fillister head
FM . . frequency modulation
FP . . . . . front panel
FREQ . . . . . frequency
FXD . . . . . fixed
g . . . . . gram
GE . . . . . germanium
GHz . . . . . gigahertz
GL . . . . . glass
GRD . . . . . ground(ed)
H . . . . . henry
h . . . . . hour
HET . . . . . heterodyne
HEX . . . . . hexagonal
HD . . . . . head
HDW . . . . . hardware
HF . . . . . high frequency
HG . . . . . mercury
HI . . . . . high
HPF . . . . . high pass filter
HR . . . . . hour (used in parts list)
HV . . . . . high voltage
Hz . . . . . Hertz
IC . . . . integrated circuit
ID . . . . . inside diameter
IF . . . . . intermediate frequency
IMPG . . . . . impregnated
in . . . . . inch
INCD . . . . . incandescent
INCL . . . . . include(s)
INP . . . . . input
INS . . . . . insulation
INT . . . . . internal
kg . . . . . kilogram
kHz . . . . . kilohertz
kΩ . . . . . kilohm
kV . . . . . kilovolt
lb . . . . . pound
LC . . . . . inductance-capacitance
LED . . light-emitting diode
LF . . . . . low frequency
LG . . . . . long
LH . . . . . left hand
LIM . . . . . limit
LIN . . . linear taper (used in parts list)
lin . . . . . linear
LK WASH . . . lock washer
LO . . . low; local oscillator
LOG . . . . logarithmic taper (used in parts list)
log . . . . . logrithm(ic)
LPF . . . . . low pass filter
LV . . . . . low voltage
m . . . . . meter (distance)
mA . . . . . milliampere
MAX . . . . . maximum
MΩ . . . . . megohm
MEG . . . . meg (10^6) (used in parts list)
MET FLM . . . . metal film
MET OX . . metallic oxide
MF . . . medium frequency; microfarad (used in parts list)
MFR . . . . . manufacturer
mg . . . . . milligram
MHz . . . . . megahertz
mH . . . . . millihenry
mho . . . . . mho
MIN . . . . . minimum
min . . . . . minute (time)
. . . ' . . . . . minute (plane angle)
MINAT . . . . . miniature
mm . . . . . millimeter
MOD . . . . . modulator
MOM . . . . . momentary
MOS . . . . . metal-oxide semiconductor
ms . . . . . millisecond
MTG . . . . . mounting
MTR . . . meter (indicating device)
mV . . . . . millivolt
mVac . . . . . millivolt, ac
mVdc . . . . . millivolt, dc
mVpk . . . . millivolt, peak

PARTS LIST

PRINTET..... 90/05/17

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	8,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H1	
2	80,000	ST	51 BR453587	SCREW M 4 X 8 HEX J GULCR	4			H2	
3	56,000	ST	51 BR333417	SCREW M 4 X10 UHJ GULCR	4			H3	
4	16,000	ST	51 BR333425	SCREW M 4 X12 UHJ GULCR	4			H4	
5	82,000	ST	51 BR321605	SCREW UNBRAK M 5X 8 CHJ G	4			H5	
6	10,000	ST	51 BR321621	SCREW UNBRAK M 5X12 CHJ G	4			H6	
7	100,000	ST	53 BR321214	WASHER,TOOTH Ø 4,3	4			H7	
8	92,000	ST	53 BR321613	WASHER,TOOTH Ø 5,3	4			H8	
9	20,000	ST	52 BR333956	NUT M 4 J GULCR	4			H9	
10	4,000	ST	51 BR321656	BOLT 5/16X35MM	4			H10	
11	4,000	ST	53 BR321664	WASHER,FLAT Ø 8,0 M CU SN	4			H11	
12	4,000	ST	52 BR321672	NUT 5/16 F/PALLE	4			H12	
13	4,000	ST	53 BR336777	WASHER,FLAT Ø 4MM CU SN M	4			H13	
14	1,000	ST	41 BR369993	PLATE,BOTTOM CS6150-621	3			MP1	
15	1,000	ST	41 BR377430	FRAME,FRONT CS6150	3			MP2	
16	1,000	ST	41 BR377449	FRAME,REAR CS6150	3			MP3	
17	2,000	ST	46 BR369950	BRACKET,TOP CS6150-621	1			MP4	
18	1,000	ST	46 BR369934	BRACKET,BOTTOM RGHT CS615	3			MP5	
19	1,000	ST	46 BR369942	BRACKET,BOTTOM LEFT CS615	3			MP6	
20	6,000	ST	41 BR371009	ADJ.PLATE F/SLIDE CS6150-	1			MP7	
21	6,000	ST	41 BR371017	PLATE F/SLIDE CS6150-621	1			MP8	
22	16,000	ST	53 BR267023	WASHER,ADJUST Ø19,8 X2MM	1			MP9	
23	7,000	ST	42 BR389927	SLIDE CS6150-621	1			MP10	A1
24	2,000	ST	41 BR494453	ADJ.PLATE F/SLIDE CS6150-	1			MP11	
25	2,000	ST	41 BR494461	PLATE F/SLIDE CS6150-621	1			MP12	
26	7,000	ST	51 BR275549	SCREW M 3 X12 CHJ GULCR	4				A1
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	******
	1,000	ST	BR430781	RACK P/P/ REMOTE CS6150	1				
	1,000	ST	210516-001	RACK P/P CS6150	1				

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TITLE: RACK MECH.MOUNTED CS6150

DOCUMENT NO.: 41 - BR430412 (430412)

REV: A1

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/05/17

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	89 210518-001	1/2 SPLIT.AS S76210S76150	1			A1	
2	21,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H1	
3	4,000	ST	51 BR275530	SCREW M 3 X10 CHJ GULCR	4			H2	
4	4,000	ST	51 BR275611	SCREW M 4 X 5 CHJ GULCR	4			H3	
5	2,000	ST	51 BR275646	SCREW M 4 X10 CHJ GULCR	4			H4	
6	4,000	ST	53 BR321052	WASHER,TOOTH Ø 3,2	4			H5	
7	4,000	ST	52 BR327506	NUT M 3 M CU SN	4			H6	
8	2,000	M	44 BR368156	GASKET COL. 18908	4			H7	
9	0,500	M	44 BR377503	EDGING KANTLIST F/2,1-3MM	4			H8	
10	125,000	ST	45 BR473960	STRAP,CABLE L197XB4,9	4			H9	
11	8,000	ST	31 BR495905	CONN D ACCESS. JACK SOCKT	4			H10	
12	0,000	ST	31 BR495905	CONN D ACCESS. JACK SOCKT	4			H11	
13	1,000	ST	59 210501-001	CHANNEL,MECH.MOUNT.CS6150	1			MP1	
14	21,000	ST	42 BR389943	SLIDE Ø19,5X18MM CS6150-6	3			MP2	
15	1,000	ST	41 BR379042	PLATE,INSULATED ETRONIT 6	3			MP3	
16	1,000	ST	41 210449-001	COVER, CONNECTOR S76150	2			MP5	
17	5,000	ST	56 224537-014	SPACER, THREADED M3X25MM	4			MP6	
18	1,000	ST	31 BR369926	TERMINAL BD 7P SCREW/TAP	4			TB1	
19	1,000	ST	37 BR425419	MULTICABL ASS W100 CS6150	1			W100	
20	1,000	ST	37 BR496308	MULTICABL ASS W103 CS6150	1			W103	
21	1,000	ST	37 BR425443	MULTICABL ASS W104 CS6150	1			W104	
22	1,000	ST	37 BR425451	MULTICABL ASS W105 CS6150	1			W105	
23	1,000	ST	37 BR496316	MULTICABL ASS W106 CS6150	1			W106	
24	1,000	ST	37 BR425486	COAX CA ASSY W107 CS6150	3			W107	
25	1,000	ST	37 BR425494	COAX CA ASSY W108 CS6150	3			W108	
26	1,000	ST	37 BR425508	MULTICABL ASS W109 CS6150	1			W109	
27	1,000	ST	37 210494-001	MULTICABLE W110	1			W110	
28	1,000	ST	37 210486-001	COAX CABLE ASSY W111	3			W111	
29	1,000	ST	37 210487-001	COAX CABLE ASSY W112	3			W112	
30	1,000	ST	37 210488-001	COAX CABLE ASSY W113	3			W113	
31	1,000	ST	37 BR425559	COAX CA ASSY W114 CS6150	3			W114	
32	1,000	ST	69 210498-001	MULTICABLE W115	1			W115	
33	0,000	ST	89 210497-001	MULTICABLE W116	1			W116	
34	0,000	ST	89 210502-001	MULTICABLE W117	1			W117	
35	0,000	ST	89 210495-001	MULTICABLE W119	1			W119	
36	0,000	ST	37 210490-001	COAX CABLE ASSY W121	3			W121	

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TITLE: CHANNEL,COOLING,AS CS6150

DOCUMENT NO.: 89 - 210499-001

REV: A

SHEET NO.: 1 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/05/17

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
37	0,000	ST	89 210489-001	MULTICABLE W123	1			W123	
38	0,000	ST	89 210496-001	MULTICABLE W124	1			W124	
39	1,000	ST	37 BR431419	CABLE ASSY W125 CS6150	1			W125	
40	0,000	ST	89 210493-001	MULTICABLE W126	1			W126	
41	0,000	ST	89 210492-001	MULTICABLE W128	1			W128	
42	0,000	ST	89 210491-001	COAX CABLE ASSY W129	3			W129	
**********	**********	**	**********	**** BILL OF DOCUMENTATION	**	**********	**********	**********	******
			210504 PD	MOUNTING DIA FOR CABLES					
**********	**********	**	**********	********** NEXT ASSY *******	**	**********	**********	**********	******
	1,000	ST	210516-001	RACK P/P CS6150	1				

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TITLE: CHANNEL, COOLING, AS CS6150

DOCUMENT NO.: 89 - 210499-001

REV: A

SHEET NO.: 2 OF 2

PARTS LIST

PRINTET..... 90/05/17

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	4,000	ST	51 BR275506	SCREW M 3 X 5 CHJ GULCR	4			H1	
2	47,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H2	
3	2,000	ST	51 BR452920	SCREW M 3 X16 CHR	4			H3	
4	2,000	ST	51 222790-017	SCREW M 4X 6 POZIDR. A2	4			H4	A1
5	4,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H5	
6	4,000	ST	51 222790-021	SCREW M 4X16 POZIDR. A2	4			H6	A1
7	24,000	ST	51 222790-026	SCREW M 5X 8 POZIDR. A2	4			H7	A1
8	16,000	ST	51 BR321605	SCREW UNBRAK M 5X 8 CHJ G	4			H8	
9	2,000	ST	53 BR452955	WASHER,NYLON Ø 3,0	4			H9	
10	6,000	ST	53 BR323845	WASHER,NYLON Ø 4,0	4			H10	
11	24,000	ST	53 BR452947	WASHER,NYLON Ø 5,0	4			H11	
12	4,000	ST	53 BR245674	WASHER,NYLON Ø10MM	4			H12	
13	52,000	ST	53 BR321052	WASHER,TOOTH Ø 3,2	4			H13	
14	4,000	ST	53 BR321214	WASHER,TOOTH Ø 4,3	4			H14	
15	1,000	ST	41 BR430412	RACK MECH.MOUNTED CS6150	1			MP1	
16	1,000	ST	89 210499-001	CHANNEL,COOLING,AS CS6150	1			MP2	
17	1,000	ST	41 BR430595	CHANNEL,RIGHT CS6150	1			MP3	
18	1,000	ST	41 210439-001	CHANNEL, LEFT S76150	1			MP4	
19	1,000	ST	41 210443-001	PLATE,LFT CHAN S76210/150	1			MP5	
20	1,000	ST	41 BR430110	PLATE F/COAX CONN. CS6150	3			MP6	
21	1,000	ST	59 210517-001	SCREEN F/TERM. BD	1			MP7	
22	1,000	ST	40 BR426504	AIR OUTLET CS6150-621	3			MP8	
23	1,000	ST	41 BR430579	PLATE,COVER CS6150	1			MP9	
24	1,000	ST	41 BR430587	PLATE,COVER CS6150	1			MP10	
25	1,000	ST	46 BR433519	BOTTOM LIST CS6150-621	1			MP11	
26	1,000	ST	41 BR425605	PLATE,RIGHT SIDE CS6150	3			MP12	
27	1,000	ST	41 BR425613	PLATE,LEFT SIDE CS6150	3			MP13	
28	1,000	ST	41 BR425591	TOP PLATE CS6150-621	3			MP14	
29	1,000	ST	41 BR431389	FRONT PLATE DUMMY 3M	1			MP15	
30	2,000	ST	41 BR264253	PLATE,LOCK 5 1/4 INCH	1			MP16	
31	4,000	ST	46 BR268682	GUIDE F/THUMBSCREW 260827	2			MP17	
32	4,000	ST	53 BR267015	WASHER,NYLON Ø12MM X15MM	3			MP18	
33	4,000	ST	51 BR260827	THUMBSCREW,KNURLED M6	3			MP19	
34	4,000	ST	52 BR269611	STAY NUT M3 X10 N7	3			MP20	
35	1,000	ST	41 BR496286	FRONT PLATE DUMMY 2M	1			MP21	
36	1,000	ST	48 210506-001	LABELS, S76150,S76210	1			MP22	

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TITLE: RACK P/P CS6150

DOCUMENT NO.: 89 - 210516-001

REV: A1

SHEET NO.: 1 OF 2

PARTS LIST

PRINTET..... 90/05/17

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
37	1,000	SÆ	45 BR373265	TELESCOP.SLIDE,PAIR 17 3/	4				
**********	**********	**	**********	*** BILL OF DOCUMENTATION	**	*******	******	**********	******
			210503 PD	DIAGRAM/PANEL CHASSIS					
**********	**********	**	**********	********* NEXT ASSY *******	**	*******	******	**********	******
	1,000	ST	BR453668	TX.S76150 3F.	1				
	1,000	ST	BR453854	TX.S76150 1F.	1				

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TITLE:	DOCUMENT NO.:	REV:	SHEET NO.:
RACK P/P CS6150	89 - 210516-001	A1	2 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR378941	PWB,1/2 SPLITTER S76150	3				
2	1,000	ST	22 BR357480	CAP. CER. 22P 100 G N150	4			C1	
3	2,000	ST	22 BR357456	CAP. CER. 12P 100 G N150	4			C2,C5	
4	2,000	ST	22 BR209554	CAP. PLST 10N 250 K	4			C3,C4	
5	1,000	ST	22 BR202975	CAP. PLST 1U 100 K	4			C6	
6	2,000	ST	23 BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR1,CR2	
7	4,000	ST	51 BR275506	SCREW M 3 X 5 CHJ GULCR	4			H1	
8	3,000	ST	31 BR261270	TERMINAL STUD	4			H2	
9	1,000	ST	45 BR371157	STRAP,CABLE L 92XB2,6	4			H3	
10	2,000	ST	33 BR363162	RELAY 42V 2K8 1XCHG.	4			K1,K2	
11	4,000	ST	52 BR269581	STAY NUT M3 X 8 N7	3			MP1	
12	9,000	ST	21 BR371033	RES FILM 100R 0,6F MRS25	4			R1,R2,R4,R5,R7,R8,R9,R10,	
								R11	
13	1,000	ST	21 BR379123	RES FILM 19R6 0,6F MRS25	4			R3	
14	1,000	ST	21 BR372420	RES FILM 121R 0,6F MRS25	4			R6	
15	1,000	ST	25 BR366641	TRAFO INP.SP,T526 PA6150	1			T1	
16	1,000	ST	25 BR366633	TRAFO INP.SP,T525 PA6150	1			T2	
17	0,250	M	32 BR223107	COAX CABLE 50R TEFLON	4			W	
**********			**********	********** BILL OF DOCUMENTATION	**********			**********	**********
			BR4440 EC	SPLITTER S76150					
**********			**********	********** NEXT ASSY **********				**********	**********
	1,000	ST	BR378992	1/2 SPLIT.AS S76150 D4440	1				

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TITLE: 1/2 SPLITTER S76150 D4440

DOCUMENT NO.: 60 - BR378968 (378968)

REV: A

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60 BR378968	1/2 SPLITTER S76150 D4440	1			A1	
2	4,000	ST	51 BR333247	SCREW M 3 X 5 UHJ GULCR	4			H1	
3	4,000	ST	51 BR333263	SCREW M 3 X 8 UHJ GULCR	4			H2	
4	2,000	ST	51 BR275530	SCREW M 3 X10 CHJ GULCR	4			H3	
5	2,000	ST	53 BR321052	WASHER,TOOTH Ø 3,2	4			H4	
6	2,000	ST	52 BR333921	NUT M 3 CONTRA J GULCR	4			H5	
7	3,000	ST	31 BR377821	TERMINAL LUG 10,2MM	4			H6	
8	1,000	ST	45 BR371157	STRAP,CABLE L 92XB2,6	4			H7	
9	3,000	ST	31 BR368210	COAX CONN BNC FEM-CHASS.	4			J	
10	1,000	ST	31 BR368369	CONN D CRIMP 9P MALE	4			J	
11	3,000	ST	31 BR368377	CONN D ACCESS. PIN 20	4			J	
12	1,000	SÆ	31 BR368512	CONN D ACCESS. LATCH	4			J	
13	1,000	ST	41 BR365033	BOX F/INP.SPLITTER CS6150	1			MP1	
14	1,000	ST	41 BR366072	PLATE,MOUNTING CS6150-621	1			MP2	
15	4,000	ST	52 BR269581	STAY NUT M3 X 8 N7	3			MP3	
16	0,060	M	32 BR331260	FLEX PLAST 4,0MM/YEL	4			W	
17	0,060	M	32 BR367230	WIRE,ELEC 0,25 YELLOW	4			W	
18	0,060	M	32 BR367303	WIRE,ELEC 0,25 GREEN	4			W	
19	0,060	M	32 BR367346	WIRE,ELEC 0,25 ORANGE	4			W	
**********				********** BILL OF DOCUMENTATION	**********				
			BR4440 EC	SPLITTER S76150					
**********				********** NEXT ASSY **********					
	1,000	ST	BR430420	CHANNEL,COOLING,AS CS6150	1				

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TITLE: 1/2 SPLIT.AS S76150 D4440

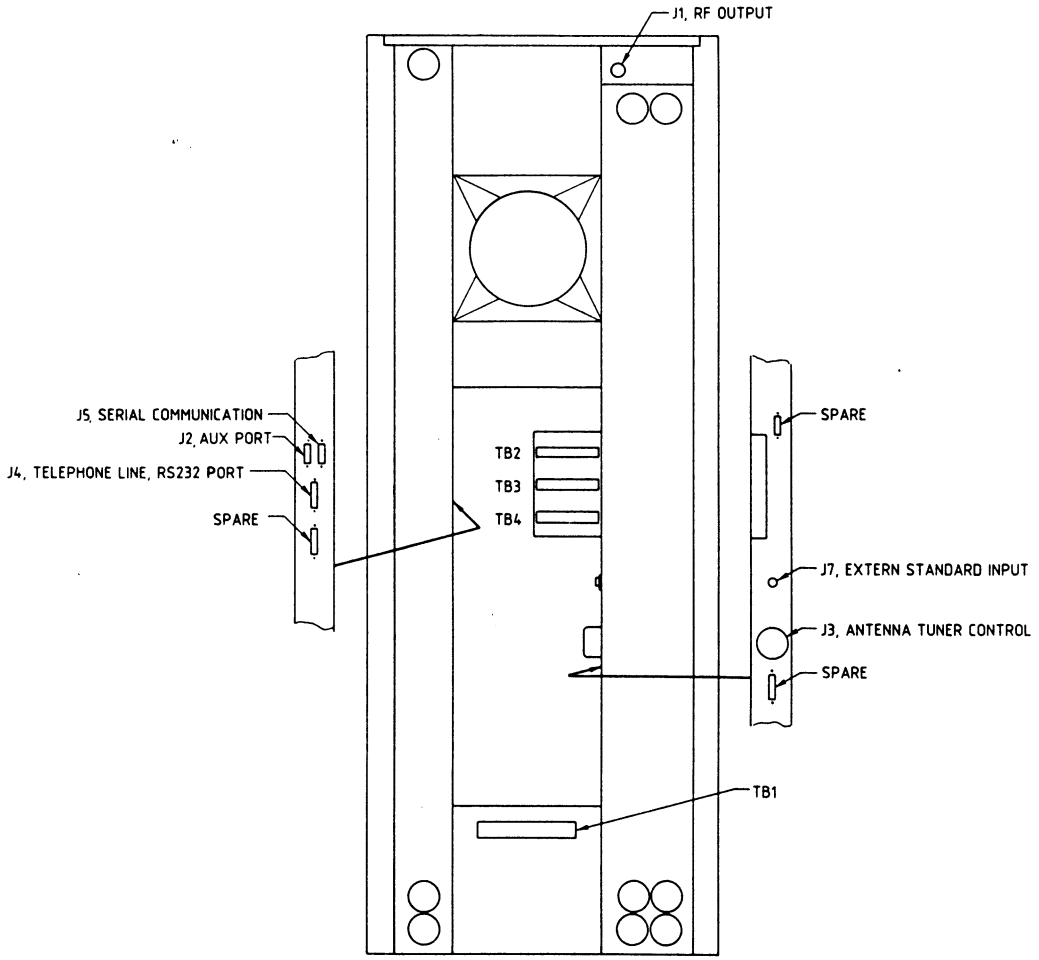
DOCUMENT NO.: 60 - BR378992 (378992)

REV: A

SHEET NO.: 1 OF 1

1.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075	
		ANGLES	DR. VH 9.12 1988
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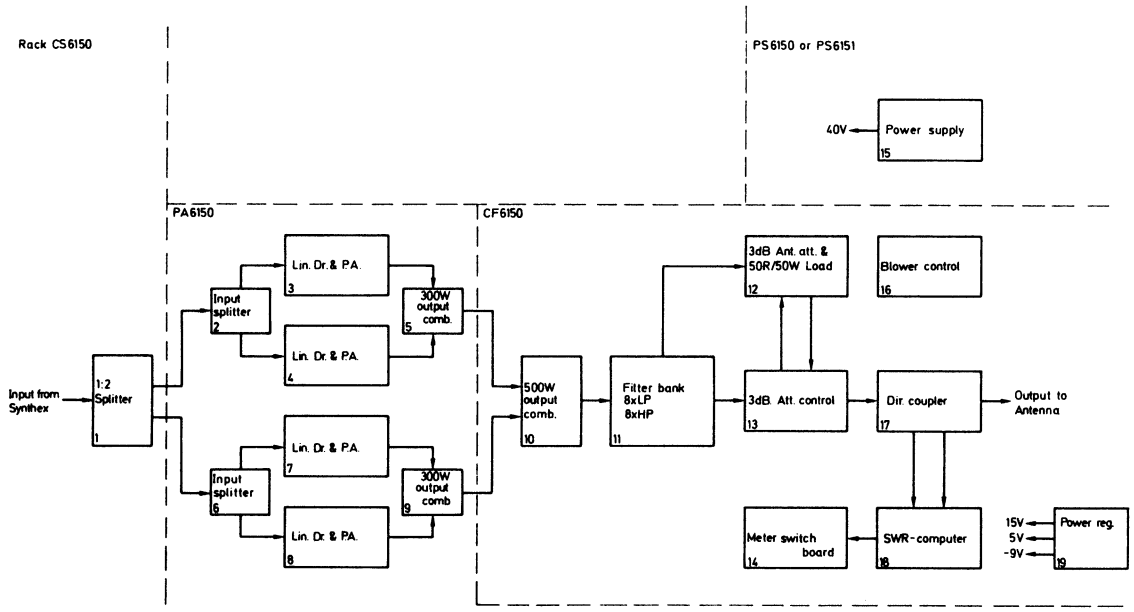
APPLICATION			

Dansk Radio AS

TITLE
REAR PANEL CONNECTIONS FOR
S76210-1 (S76150-1)
TRANSMITTER RACK

SIZE	CODE IDENT	DRAWING NO
A2		49 65 96
SCALE		SHEET 1 OF 1



Block Diagram
Power Amplifier part

Ref. Designation 4471

S76150 DIAG No. 4471

Note 1:

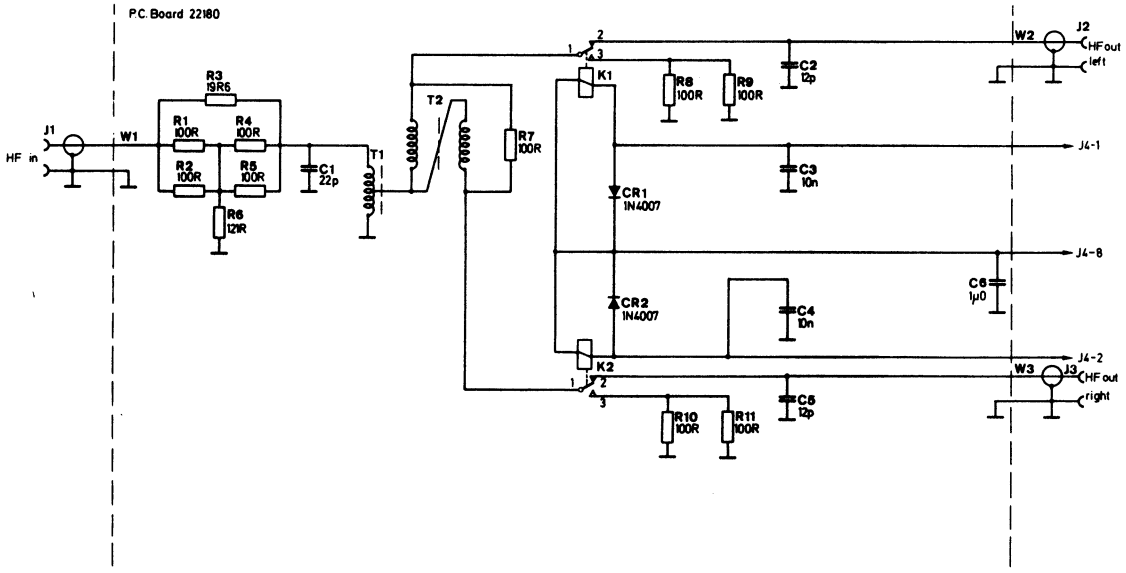
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and µ, (pF, nF, and µF).

The inductance units are indicated by means of the international prefixes µ, and m, (µH, and mH).



CS6150 DIAG No. 4440

1:2 Splitter
Ref. Designation 4440

C O N T E N T S

General:	The HF power amplifier PA 6150 is a wideband all solid state linear HF power amplifier panel designed to be used in the HF SSB/ISB transmitters S 76210-1 and S 76150-1. Its construction and reliability make it attractive for use in other connections where a HF power of 500-600 W in the frequency range 1.5-30 MHz and low intermodulation distortion is required. The power amplifier panel employs two independent 300-W amplifier units and a common forced air-cooling system. Each 300-W amplifier unit is made up of two 150-W push-pull amplifiers containing a class-A driver amplifier and a class-AB output amplifier. The input signal for each 300-W amplifier unit is fed to an input splitter dividing the signal between the two 150-W amplifiers, the outputs of which are combined to provide the desired 300 W by means of an output combiner. The amplifiers are protected against excess heat sink temperature by means of thermal switches mounted on each 150-W amplifier heat sink controlling the switching off of the 40 V DC supply for the 300-W amplifier unit. Means are provided for measuring driver and output stage collector supply current and supply voltage. A gain reduction of approx. 13 dB is possible by grounding a single control line, which by-passes the output stage and removes its bias.
Frequency Range:	1.5 - 30 MHz.
Gain:	36 dB +/- 2.5 dB.
Output Power:	Max. 300 W CW and PEP.
Harmonic Distortion:	2nd harmonic: less than -25 dBr 3rd harmonic: less than -15 dBr at 300 W CW output.
Intermodulation:	Typically more than 35 dB below two-tone test signal level at max. output power.
Input and Output Impedance:	50 ohms.
Cooling:	Built-in blower with heat sink temperature supervision, max. 112°C.

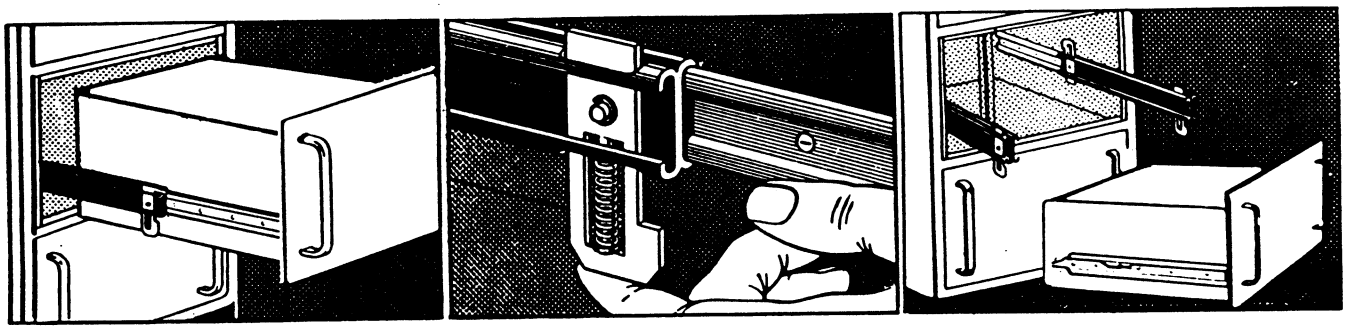
Power Requirements:	40 V DC +/- 1 V, max. 37,5 A at 300 W CW output
	41 V DC +/- 1 V, max. 28 A at 300 W PEP two-tone output
	115 V AC +/- 10%, 45 to 66 Hz. 65 V A for blower.
Environmental Conditions:	Operating Temperature: -15°C to +55°C
	Storage Temperature: -40°C to +70°C
	Relative Humidity: 95% at 40°C
	Shock and Vibration: According to MIL-STD-810B
Dimensions:	Panel width: 19" (483 mm)
	Panel Height: 180 mm
	Panel Depth: 470 mm
Weight:	28 kg approx.

SECTION 2. DESCRIPTION

2.1. Mechanical Description

The "500-W Power Amplifier" panel-and-chassis assembly (drawer) is designed to be mounted on telescopic slides in a standard 19-inch cabinet rack.

The front panel is fastened to the cabinet rack by means of captive panel-mounting screws. The telescopic slides are fitted with trigger latches which automatically and securely lock the unit in the withdrawn position, when fully extended. The projecting latches are pressed (see drawing) to release the lock so that the drawer can be closed or completely removed from the cabinet rack. Before removing a drawer from the cabinet all plugs on the rear panel should be taken out of their sockets.



For the purpose of making the panel-and-chassis assembly resistant against heavy shock and vibration influences the chassis is divided into three main compartments by means of two partitions. One parallel with the front and rear panels and one at right angles to and between the above mentioned partition and the chassis front plate.

The two compartments behind the chassis front plate contain the two 300-W amplifier units. The front panel carries the two air-inlet filters for the cooling air for two amplifier units. These filters are removable from the front side.

The compartment between the rear panel and the partition parallel to it contains the blower and the collecting chamber for the cooling air from the two amplifier units.

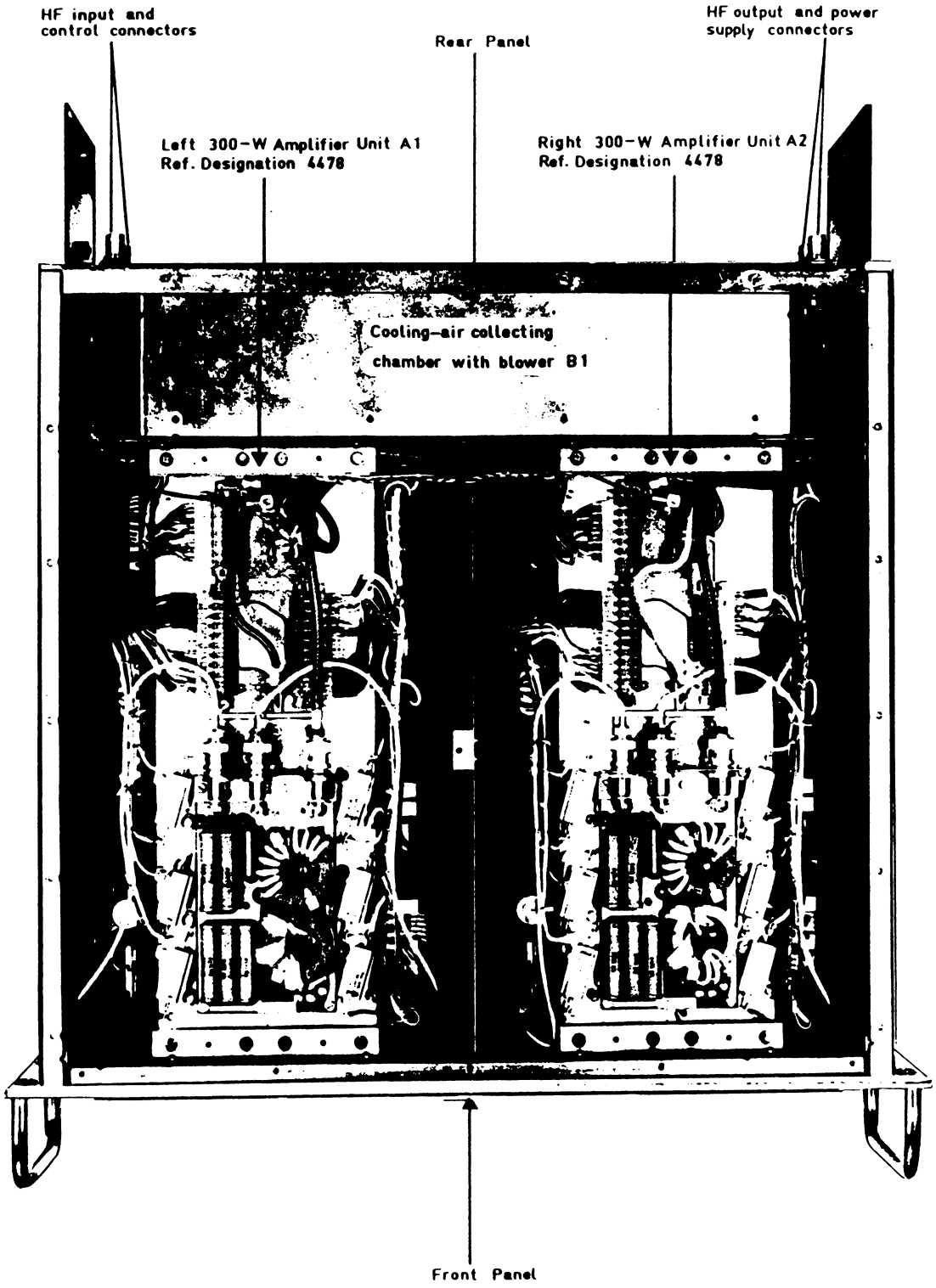
The rear panel carries the blower, the two HF input connectors farthest to the left, the two HF output connectors and the power supply connector farthest to the right seen from the front panel.

The 300-W amplifier unit is built up around the sturdy heat sinks of the two 150-W amplifiers. These heat sinks make up the chassis for the 300-W amplifier and are held together by means of two U-shaped profiles and a fishplate in the top plane and a longitudinal fishplate in the bottom plane. Besides carrying the two 150-W amplifier boards with associated power devices the heat sinks also carry the 1:2 input splitter and the 2:1 output combiner boards.

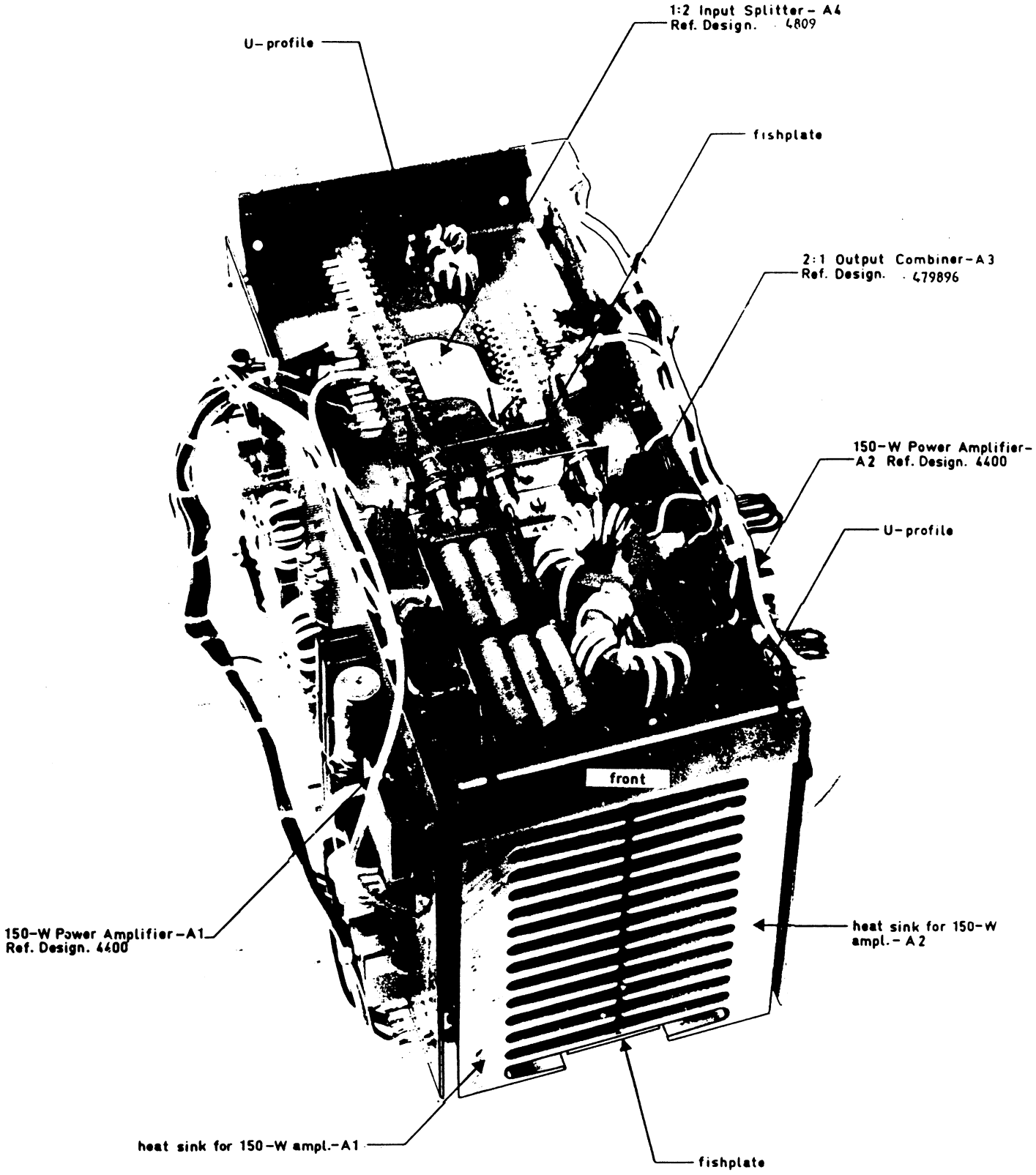
Each of the two 300-W amplifier units is held in position by means of six screws through the chassis bottom plate.

The top cover and the chassis bottom plate are provided with ventilation holes for convection cooling of the components inside the drawer and must not be covered.

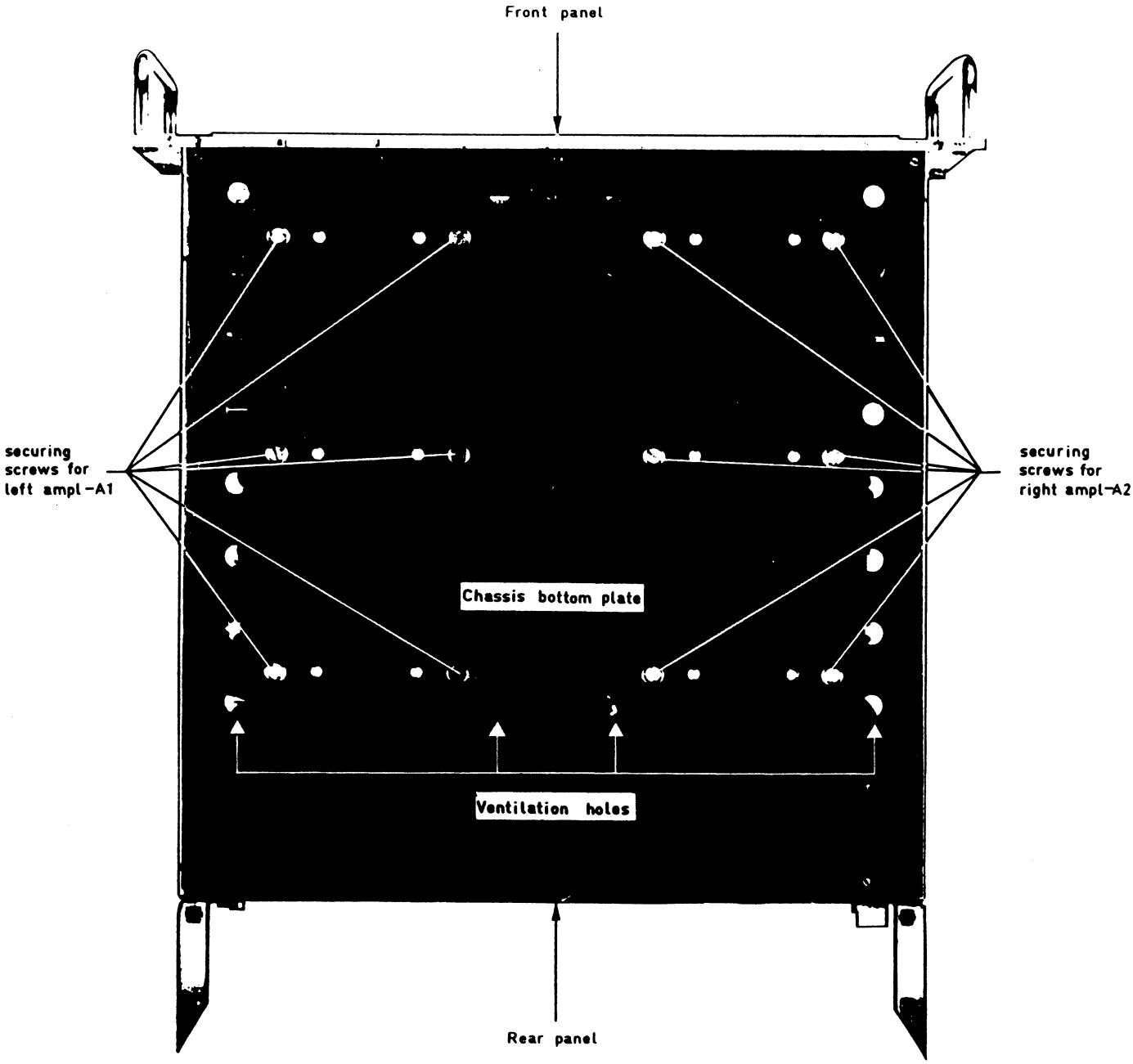
For further information on the location of the separate circuits, see the following photos.



Top View, 500-W PA Panel
Ref. Designation 4416



300-W Amplifier Unit
Ref. Designation 4478



Bottom view, 500-W PA Panel
Ref. Designation 4416

2.2. Electrical Description.

2.2.1. Block Diagrams.

The diagrams are located in Section 9 of this description.

2.2.1.1. 500 W PA Panel.
Reference Designation 4445

The block diagram shows the two 300 W amplifier modules, each of which receives the input signal from the 1:2 (1:4) power splitter mounted in the rack of the HF SSB/ISB transmitter S 76150 (S 76210 and cabled between the SYNTHEX SE 4010 and the PA 6150 panels.

The output from each 300 W Amplifier Unit is fed to the 2:1 500 W/ 4:1 1000 W Power Combiner, in the CF 6150/CF 6210 Combination and Filter Panel.

Each of the two 300 W Amplifier Units consists of two separate 150 W Power Amplifiers, represented as diagram blocks 2,3 and blocks 6,7. Inputs to these two sets of 150 Power Amplifiers is applied through two separate 1:2 Input Splitters; represented by diagram blocks 1 and 5. Outputs of the two sets of 150 Power Amplifiers are combined in two 2:1 300 W Output Combiners, represented by diagram blocks 4 and 8.

2.2.1.2. 150 W Power Amplifier.
Reference Designation 4444

The input to the 150 W Power Amplifier is first passed through a constant impedance frequency correction network in block 1, shaped to give a certain compensation of the succeeding driver amplifier stage in block 2. The driver amplifier is a class-A push-pull stage, the output of which can be fed either to the input of the succeeding 150 W output stage in block 3 or directly to the output terminal of the 150 W Power Amplifier. This gives the possibility of a gain reduction of approx. 13 dB and a retention of the good intermodulation performance even at reduced power levels because class-A is employed in this stage.

The 150 W output amplifier operates in a class-AB push-pull with an associated bias circuit in block 4. This bias circuit has a low output impedance and is temperature controlled by the temperature of one of the two output transistors. The bias of these transistors is thus to a degree, independent of temperature and varying bias current demands at different power levels.

2.2.2. Interconnection Diagrams.

The diagrams are located in chapter 9.2. of this manual.

2.2.2.1. Interconnections, 500-W PA Panel. Reference Designation 4416

Diagram No. 4416 shows the interconnections in the "500-W PA Panel". Apart from diagram Nos. each block in the diagram has been provided with a letter and figure identification to allow references on jacks and plugs, i.e. looking at the lower right-hand corner of the diagram at the block named "Output Combiner 300-W" in the "Right 300-W Amplifier Unit" with reference designation 4478 and marked A2. It is marked "Ref. design.No. 479896",which is also the diagram number. The block is also marked with a "A2A3", so that the complete reference designations of jacks J1 and J2 are "A2A3J1" and "A2A3J2".

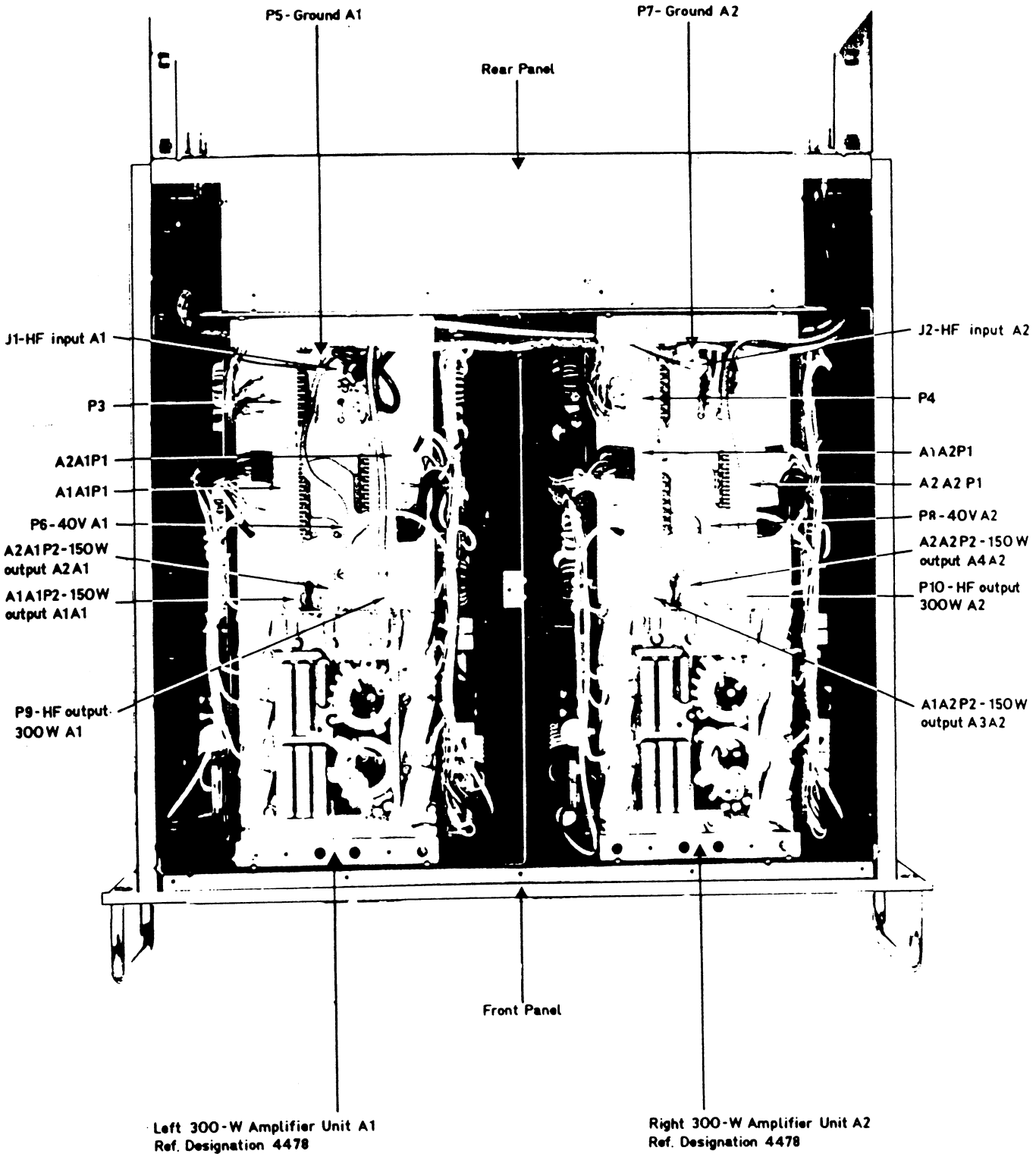
The jacks with the numbers J1, J2, J3, J4, J5 and J6 are located at the rear panel. See photos in chapter 3.2.

For information on the location of the individual blocks of the "500-W PA Panel" see photos in chapter 2.1. Regarding the inside jacks and plugs see the following photo.

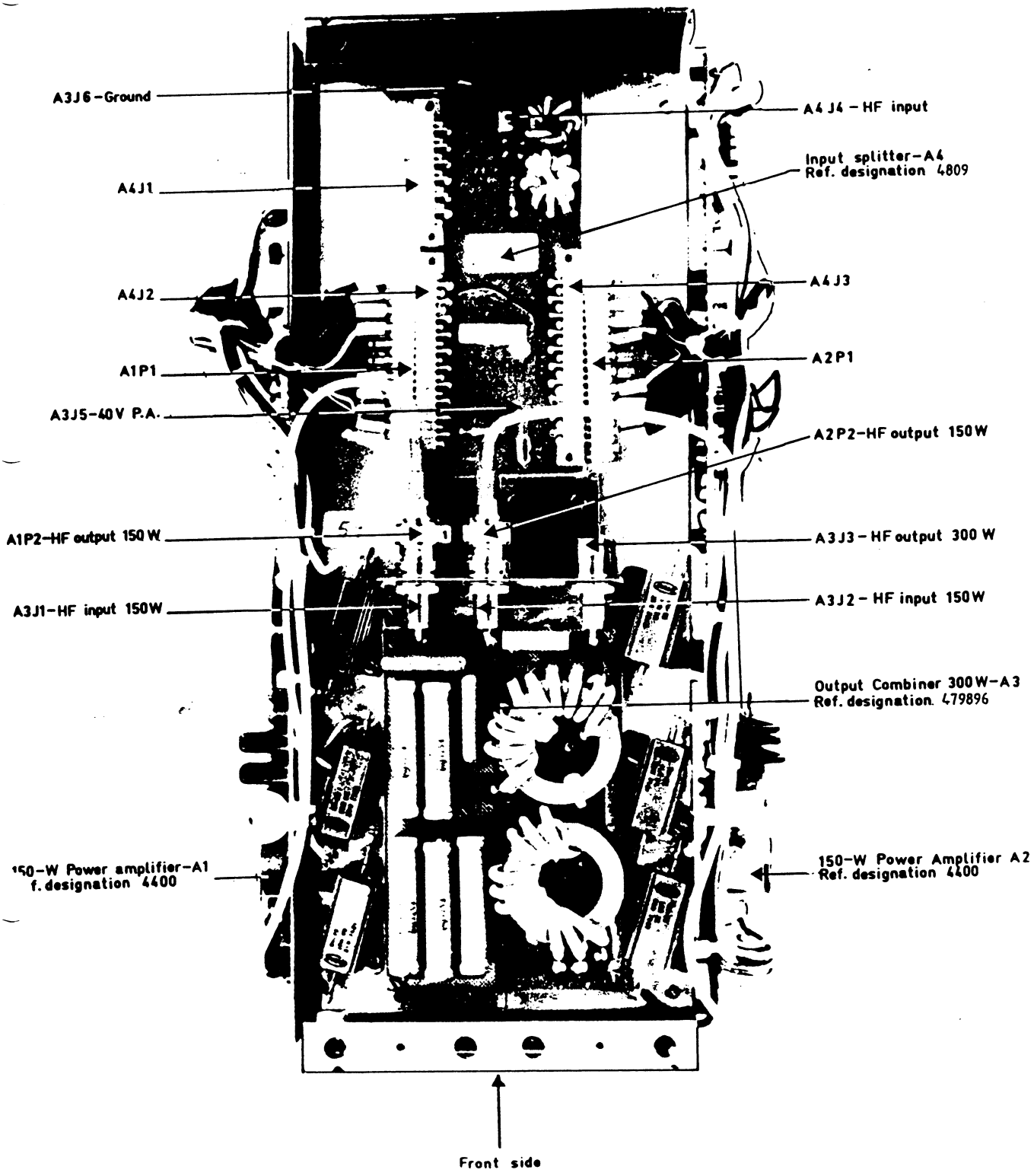
2.2.2.2. Interconnections, 300-W Amplifier Unit. Reference Designation 4478.

Diagram 4478 shows the interconnections of the 300-W Amplifier Unit. Each block in the diagram has been provided with a letter and figure identification as mentioned in chapter 2.2.2.1.

The following photo shows the positions of the individual circuits, jacks and plugs.



Interconnections, 500-W PA Panel
Ref. Designation 4416



Top View, 300-W Amplifier Unit
Ref. Designation 4478

2.2.3. Circuit Diagrams.

2.2.3.1. 150 W Power Amplifier. Reference Designation 4400

The HF-input signal is fed to a bridge-T network (R101, R102, R103, R104, C101 and L101). This T-network ensures constant impedance frequency correction of the driver amplifier. Correction is approx. -12 dB at 1.6 MHz, -7.5 dB at 15 MHz and -6.5 dB at 30 MHz.

The driver amplifier is made up of Q101 and Q102 (BLX 13) and functions as a 10-W class-A push-pull stage.

The input is matched to 50 ohms by means of T101, a 2:1 unbalanced to balanced transformer (50-ohm unbal./12.5-ohm bal.). Low frequency input-impedance correction is performed by L102/R105 and L103/R106, that insure a low SWR figure over the entire frequency range.

Output-load impedance is 50-ohm balanced.

The DC stabilization is performed by the zener diodes CR101, CR102 and dropping resistors R111, R135 which maintain a constant V_{ce} for Q101 and Q102 of between 25 V and 30 V.

Transistors with an extremely low hFE value require a reduced value of R107 or R108 to hold V_{ce} under 30 V.

The collector currents are thus determined by the voltage drop across R111 and R135. As the Vcc-Dr supply voltage varies from 44.5 V to 40.0 V, the Icc-Dr varies from 2.2 A to 1.5 A. This is the total current consumption for the driver stage and is monitored by means of the voltage drop across R113, fed to the instrument circuit of the "CF 6210/CF 6150" panel through R112 and R133 and connected to P1-7 and P1-8. 3A will produce 300 mV across 0.1 ohms. Because the instrument circuit has a resistance of 100 ohms the serial combination R112, "instrument circuit" and R133 will produce a voltage drop of 100 mV across the instrument circuit.

The driver output is switched to either the input of the power stage or directly to the HF-OUTPUT through a balanced to unbalanced 1:1 transformer T102. This is done by relays K101 and K102, thus the driver output is used directly at the reduced power levels "-12 dB" and "-18 dB". Relays K101 and K102 are activated at the SYNTHEX SE 6000 where activation of the power level pushbuttons complete relay ground return via P1-4.

The output power amplifier is made up of Q103 and Q104 (BLX 15) forming a 150 W class-AB push-pull stage. Q103 and Q104 should be matched hFE-wise to within +/- 12 per cent at 1.4 A, 6 V.

The input is matched to 50 ohms by means of T103, a 3:1 balanced to balanced transformer (50-ohm bal./5.55-ohm bal.). A frequency and impedance correction network is placed between the transformer T103 and the inputs of the two power transistors Q103 and Q104 (R114 through 121 and C119 through 124). Capacitor C140 at the input of T103, improves the SWR in the high frequency range.

The output collector-to-collector load impedance is 12.5-ohms balanced, and is matched to the required 50 ohms, unbalanced by means of 1:2 balanced to unbalanced transformer, T104. Balancing transformer T105 improves the balance of the collector-to-collector load from T104 especially at low frequencies and serves as collector supply choke

for Q103 and Q104. Low frequency compensation of T104 and T105 is performed by means of C130 and C131.

The necessary base bias voltage for achieving the required zero signal collector current independent of temperature and power level is supplied from the bias circuit made up of Q105 and Q106, that form a voltage stabilizer. The output voltage is determined partly by V_{BE} of Q106 and partly by the voltage drop across R134 giving a possibility for adjustment. Q106 is in good thermal contact with Q104, so that the change of V_{BE} of Q104 (and Q103) and Q106 with the temperature will be equal because of equal temperature coefficients. This temperature stabilizes the zero signal collector currents of Q103 and Q104.

The total collector current consumption of Q103 and Q104 is monitored by means of the voltage drop across R125, R126, R127 and R128 fed to the instrument circuit of the CF 6210/CF 6150 panel through R131 and R132 connected to P1-5 and P1-6. 12A will produce 300 MV across 0.25 ohms. Because the instrument circuit has a resistance of 100 ohms, the serial combination R131, "instrument circuit", and R132 will produce a voltage drop of 100 mV across the instrument circuit. The bias voltage is adjusted by means of R134 for a total zero signal collector current of Q103 and Q104 at 200 mA corresponding to an unloaded voltage at 5 mV between P1-5 and P1-6.

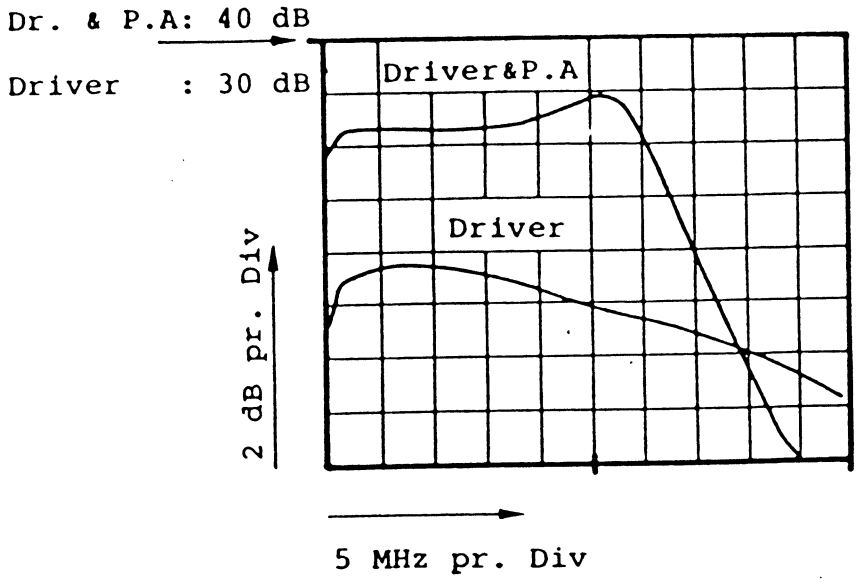
The bias voltage of Q103 and Q104 is removed in the reduced power levels, when the driver is used alone, by means of the relay K102.

The circuit is provided with a coaxial test jack J101 for the purpose of a possibility of a separate test of the output amplifier. For this the relay K101 is engaged by a grounding of the terminal named "PA test" (see photo at diagram no. 4400 in section 9.2.) thus switching the input of the output amplifier from the driver output to the test jack J101.

The power devices CR101, CR102, Q101, Q102, R111, R135, Q103, Q104 and R122 are all mounted on a common heat sink the temperature of which is maintained below $100^{o}C$ up to an ambient temperature of $55^{o}C$ by means of the built-in forced air-cooling system.

The heat sink temperature is supervised by means of the thermal switch ST1, with a nominal opening temperature of $112^{o}C$, connected to the Error Logic circuit in the CF 6210/CF 6150 panel via P1-3 and P1-9 controlling the switching off of the HF input and power supply for the entire 300 W Amplifier Unit.

The following drawing shows the typical gain-frequency characteristic for partly the complete 150 W Power Amplifier and partly the driver amplifier alone.



2.2.3.2. Input Splitter.
Reference Designation 4809

The circuit serves two purposes. Partly the splitting of the HF-input signal between the inputs of the two 150 W Power Amplifiers, and partly the distribution of DC power and collecting of measuring lines for the power amplifiers.

The signal splitter is made up by the hybrid transformer T525 with the associated balancing resistor R525.

The 1.4:. autotransformer T526 transforms the 50-ohm input impedance to the necessary 25-ohm input impedance for the hybrid transformer.

High frequency compensation is performed by means of C525 and C526.

The thermal switches ST1 of the two 150 W Power Amplifiers are connected in series with each other and connected to the 40 V DC supply via resistor R526 and J1b-1 and finally fed to the Error Logic in the CF 6210/CF 6150 panel via J1a-6.

2.2.3.3. Output Combiner, 300 W.
Reference Designation 479896.

The circuit combines the output signals from the two 150 W Power Amplifiers fed to the input jacks J1 and J2 to 300 W output power at jack J3.

The combiner is made up by the hybrid transformer T1 with the associated balancing resistors R1 through R5.

The 4:3 transformer T2 transforms the 50-ohm load impedance to the necessary 25-ohm load for the hybrid transformer.

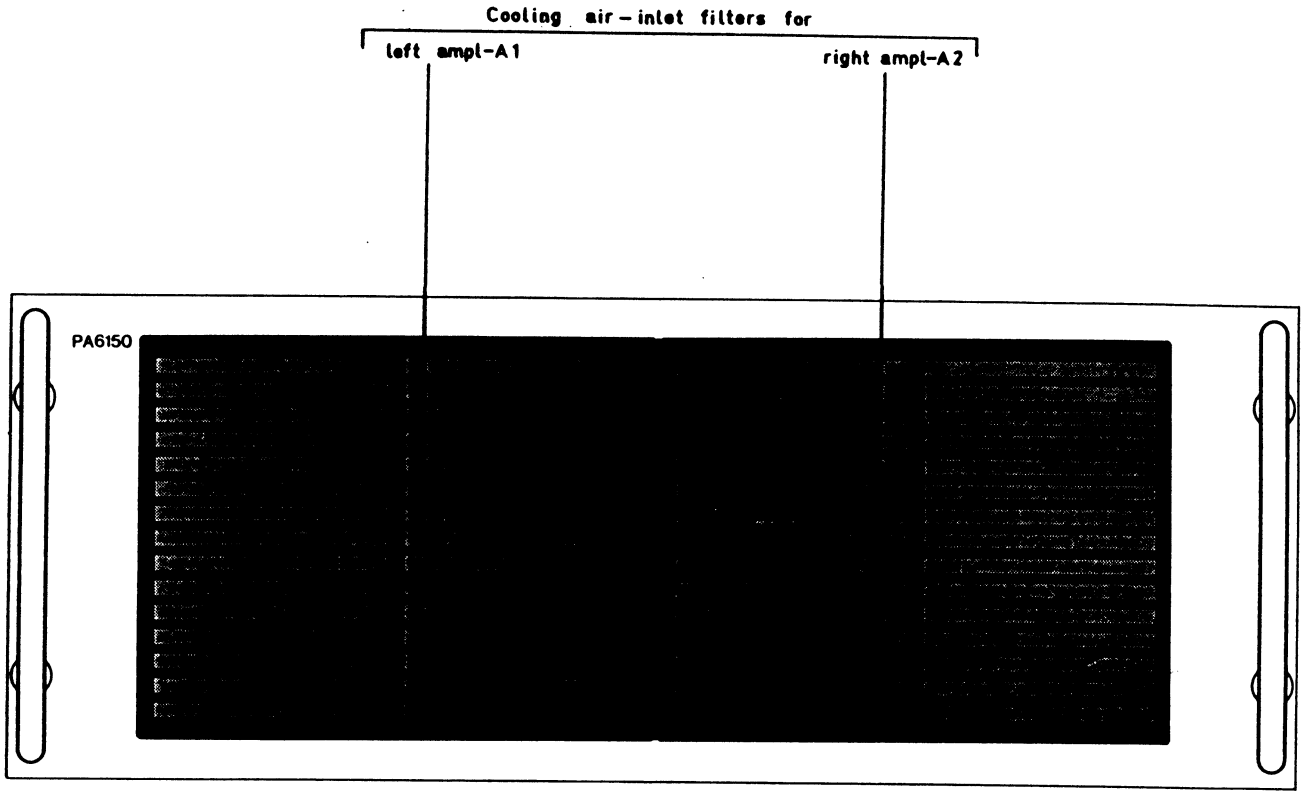
Low frequency compensation is performed by means of C 1 and C 2, high frequency compensation by means of L 1 and C 3. The isolation between the imputs is more than 25 dB, when the output is loaded with 50 ohms.

The insertion loss is maximum at 30 MHz and approx. 0.25 dB.

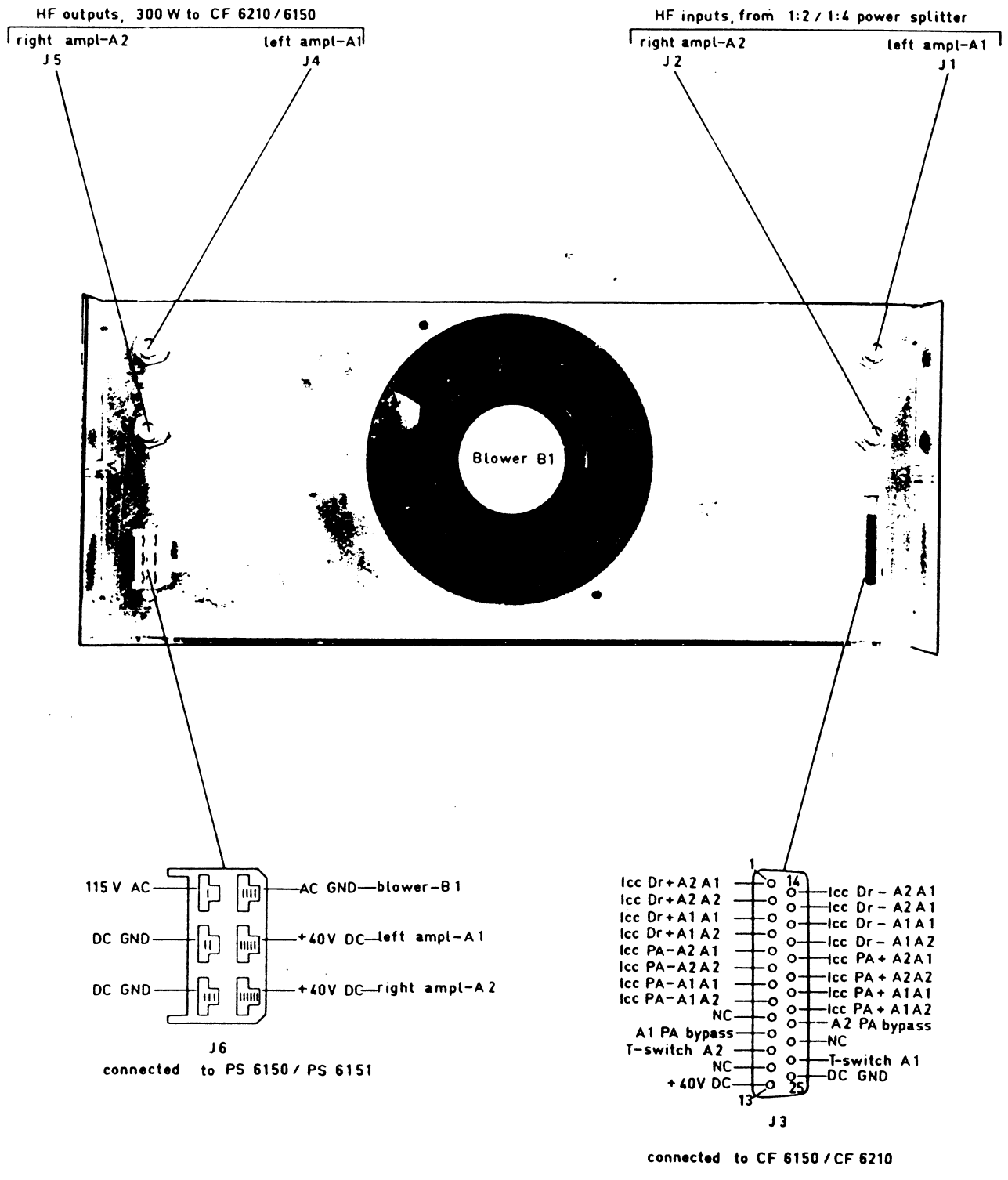
CR 1 and U 1 form an unbalance-detector that shuts off the power supply of the 300 W amplifier module when there is excessive output difference between both 150 W amplifiers.

SECTION 3. AIR FILTERS AND CONNECTORS

3.1. Front Panel



Front view, 500-W PA Panel
Ref. Designation 4416



Rear view, 500-W PA Panel
Ref. Designation 4416

SECTION 4. - INSTALLATION

The "500-W PA Panel" is designed to be mounted in a standard 19-inch. cabinet rack.

The exhausted cooling air might be conducted away from the rack and the installation room by means of an air channel/tube connected with the rear panel and tightened with a soft gasket.

It should be arranged to permit a total air flow through the "500-W PA Panel" of more than 165 m^3/h at the maximum ambient temperature at $55^{\circ}C$.

The temperature rise of the cooling air will be up to $20^{\circ}C$, i.e. a temperature of up to $75^{\circ}C$ of the exhausted cooling air could be expected at an ambient temperature at $55^{\circ}C$.

SECTION 5. OPERATING INSTRUCTIONS

See section 5, Synthex SE4010.

SECTION 6. - MAINTENANCE.

The cooling air-inlet filters should be checked regularly and cleaned or changed depending on operating hours and environment. Please refer to page 3.1 of section 3.

Order no. of filter : 377864.

REFERENCE LIST

MODULES PA 6150

Dansk Radio AS dra

P.C. nr.	Diagram nr.	Description	Component nr.
21636	D 4400	Right Poweramp 150w PA 6150	379077
21636	D 4400	Left Poweramp 150W PA 6150	363766
23297	D 4809	Input Splitt. PA150	442372
479888	479896	Power Comb. PA6150 300W	479896

SECTION 8. PARTS LISTS AND COMPONENT SPECIFICATIONS.

8.1. Parts Lists.

This section gives for each module all components used. The parts lists are arranged in order of module (= diagram) numbers. The components are identified by their DRA code numbers.

REFERENCE DESIGNATIONS

A . . . . . assembly
AT . . attenuator; isolator; termination
B . . . . . fan; motor
BT . . . . . battery
C . . . . . capacitor
CP . . . . . coupler
CR . . . . . diode; diode thyristor; varactor
DC . . . directional coupler
DL . . . . . delay line
DS . . . . . annunciator; signaling device (audible or visual); lamp; LED
E . . . . . miscellaneous electrical part
F . . . . . fuse
FL . . . . . filter
H . . . . . hardware
HY . . . . . circulator
J . . . electrical connector (stationary portion); jack
K . . . . . relay
L . . . . . coil; inductor
M . . . . . meter
MP . . . . . miscellaneous mechanical part
P . . . electrical connector (movable portion); plug
Q . . . . . transistor; SCR; triode thyristor
R . . . . . resistor
RT . . . . . thermistor
S . . . . . switch
T . . . . . transformer
TB . . . . . terminal board
TC . . . . . thermocouple
TP . . . . . test point
U . . . . . integrated circuit; microcircuit
V . . . . . electron tube
VR . . . . voltage regulator; breakdown diode
W . . . . cable; transmission path; wire
X . . . . . socket
Y . . . . crystal unit (piezo-electric or quartz)
Z . . . . tuned cavity; tuned circuit

ABBREVIATIONS

A . . . . . ampere
ac . . . . alternating current
ACCESS . . . . . accessory
ADJ . . . . . adjustment
A/D . . . . analog-to-digital
AF . . . . . audio frequency
AFC . . . . . automatic frequency control
AGC . . . . . automatic gain control
AL . . . . . aluminum
ALC . . . . . automatic level control
AM . . . amplitude modulation
AMPL . . . . . amplifier
APC . . . . automatic phase control
ASSY . . . . . assembly
AUX . . . . . auxiliary
avg . . . . . average
AWG . . . . American wire gauge
BAL . . . . . balance
BCD . . . . . binary coded decimal
BD . . . . . board
BE CU . . . . . beryllium copper
BFO . . . . . beat frequency oscillator
BH . . . . . binder head
BKDN . . . . . breakdown
BP . . . . . bandpass
BPF . . . . . bandpass filter
BRS . . . . . brass
BWO . . . . . backward-wave oscillator
CAL . . . . . calibrate
ccw . . counter-clockwise
CER . . . . . ceramic
CHAN . . . . . channel
cm . . . . . centimeter
CMO . . cabinet mount only
COAX . . . . . coaxial
COEF . . . . . coefficient
COM . . . . . common
COMP . . . . . composition
COMPL . . . . . complete
CONN . . . . . connector
CP . . . . . cadmium plate
CRT . . . cathode-ray tube
CTL . . . . complementary transistor logic
CW . . . . . continuous wave
cw . . . . . clockwise
cm . . . . . centimeter
D/A . . . . digital-to-analog
dB . . . . . decibel
dBm . . . . decibel referred to 1 mW
dc . . . . . direct current
deg . . degree (temperature interval or difference)
° . . . . . degree (plane angle)
°C . . . . . degree Celsius (centigrade)
°F . . . . degree Fahrenheit
°K . . . . . degree Kelvin
DEPC . . deposited carbon
DET . . . . . detector
diam . . . . . diameter
DIA . . . diameter (used in parts list)
DIFF AMPL . . differential amplifier
div . . . . . dividon
DPDT . . . . . double-pole, double-throw
DR . . . . . drive
DSB . . . . double sideband
DTL . . . . diode transistor logic
DVM . . . digital voltmeter
ECL . . . . emitter coupled logic
EMF . . electromotive force
EDP . . . . . electronic data processing
ELECT . . . . . electrolytic
ENCAP . . . . encapsulated
EXT . . . . . external
F . . . . . farad
FET . . . . . field-effect transistor
F/F . . . . . flip-flop
FH . . . . . flat head
FIL H . . . . . fillister head
FM . . frequency modulation
FP . . . . . front panel
FREQ . . . . . frequency
FXD . . . . . fixed
g . . . . . gram
GE . . . . . germanium
GHz . . . . . gigahertz
GL . . . . . glass
GRD . . . . . ground(ed)
H . . . . . henry
h . . . . . hour
HET . . . . . heterodyne
HEX . . . . . hexagonal
HD . . . . . head
HDW . . . . . hardware
HF . . . . . high frequency
HG . . . . . mercury
HI . . . . . high
HPF . . . . . high pass filter
HR . . . . . hour (used in parts list)
HV . . . . . high voltage
Hz . . . . . Hertz
IC . . . . integrated circuit
ID . . . . . inside diameter
IF . . . . . intermediate frequency
IMPG . . . . . impregnated
in . . . . . inch
INCD . . . . . incandescent
INCL . . . . . include(s)
INP . . . . . input
INS . . . . . insulation
INT . . . . . internal
kg . . . . . kilogram
kHz . . . . . kilohertz
kΩ . . . . . kilohm
kV . . . . . kilovolt
lb . . . . . pound
LC . . . . . inductance-capacitance
LED . . light-emitting diode
LF . . . . . low frequency
LG . . . . . long
LH . . . . . left hand
LIM . . . . . limit
LIN . . . linear taper (used in parts list)
lin . . . . . linear
LK WASH . . . lock washer
LO . . . low; local oscillator
LOG . . . . logarithmic taper (used in parts list)
log . . . . . logrithm(ic)
LPF . . . . . low pass filter
LV . . . . . low voltage
m . . . . . meter (distance)
mA . . . . . milliampere
MAX . . . . . maximum
MΩ . . . . . megohm
MEG . . . . meg (10^6) (used in parts list)
MET FLM . . . . metal film
MET OX . . metallic oxide
MF . . . medium frequency; microfarad (used in parts list)
MFR . . . . . manufacturer
mg . . . . . milligram
MHz . . . . . megahertz
mH . . . . . millihenry
mho . . . . . mho
MIN . . . . . minumum
min . . . . . minute (time)
' . . . . . minute (plane angle)
MINAT . . . . . miniature
mm . . . . . millimeter
MOD . . . . . modulator
MOM . . . . . momentary
MOS . . . . . metal-oxide semiconductor
ms . . . . . millisecond
MTG . . . . . mounting
MTR . . . meter (indicating device)
mV . . . . . millivolt
mVac . . . . . millivolt, ac
mVdc . . . . . millivolt, dc
mVpk . . . . millivolt, peak

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PR... 90/01/..

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR363774	PWB,POWERAMPL.150W PA6150	3				
2	3,000	ST	23 BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR03,CR04,CR05	
3	1,000	ST	22 BR357553	CAP. CER. 82P 100 C N150	4			C101	
4	4,000	ST	22 BR344273	CAP. PLST 22N 250 K	4			C105,C106,C107,C108	
5	2,000	ST	22 BR209759	CAP. TAN. 22U 16 S	4			C109,C110	
6	2,000	ST	22 BR202967	CAP. PLST 100N 100 K	4			C112,C117	
7	4,000	ST	22 BR202991	CAP. PLST 220N 100 K	4			C113,C114,C115,C116	
8	6,000	ST	22 BR203165	CAP. PLST 1N5 250 G	4			C119,C120,C121,C122,C123, C124	
9	1,000	ST	22 BR209368	CAP. ELEC 220U 64 T LL	4			C125	
10	4,000	ST	22 BR361887	CAP. PLST 220N 400 K	4			C126,C127,C128,C129	
11	2,000	ST	22 BR368768	CAP. MICA 33N 500 K	4			C130,C131	
12	5,000	ST	22 BR202975	CAP. PLST 1U 100 K	4			C132,C133,C134,C135,C136	
13	2,000	ST	22 BR209554	CAP. PLST 10N 250 K	4			C137,C138	
14	1,000	ST	22 BR209791	CAP. TAN. 2U2 35 S	4			C139	
15	1,000	ST	22 BR371068	CAP. CER. 120P 630 K N750	4			C140	
16	2,000	ST	51 BR275395	SCREW M 2 X10 CHJ GULCR	4			H1	
17	6,000	ST	52 BR327476	NUT M 2 M CU SN	4			H2	
18	22,000	ST	54 BR249823	STEATITPERLE 5MM	4			H3	
19	26,000	ST	31 BR261270	TERMINAL STUD	4			H4	
20	1,000	ST	31 BR358665	COAX CONN SMB FEM-PWB	4			J101	
21	2,000	ST	33 BR363588	RELAY 36V 4K7 2XCHG.	4			K101,K102	
22	1,000	ST	25 BR363278	COIL,CHOKE 0U33 M	4			L101	
23	2,000	ST	25 BR362964	COIL,CHOKE 0U1 K 3A	4			L102,L103	
24	8,000	ST	25 BR362948	COIL,CHOKE 10U K	4			L104,L105,L106,L107,L108, L109,L110,L111	
25	1,000	ST	25 BR496804	COIL,CHOKE 4U 6A	4			L114	
26	1,000	ST	44 BR371041	LOCK F.TRANSISTOR PA6150	3			MP1	
27	1,000	ST	26 BR488593	TRANS.HIPOW BLX-THX PAIR	1			Q	
28	1,000	ST	26 BR362972	TRANS.HIPOW 2N4921 SI-N 7	4			Q106	
29	1,000	ST	21 BR240249	RES CARB. 150R 1/4J SFR25	4			R101	
30	2,000	ST	21 BR240184	RES CARB. 47R 1/4J SFR25	4			R102,R103	
31	1,000	ST	21 BR362913	RES CARB. 15R 1/4J SFR25	4			R104	
32	2,000	ST	21 BR240141	RES CARB. 27R 1/4J SFR25	4			R105,R106	
33	2,000	ST	21 BR361844	RES WIREW 33R 4J	4			R107,R108	
34	2,000	ST	21 BR362883	RES CARB. 8R2 1/4J SFR25	4			R109,R110	

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TITLE:
POWERAMP. 150W PA6150 D440

DOCUMENT NO.:
61 - BR363766
(363766

REV:
A

SHEET NO.:
1 OF 2

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
35	4,000	ST	21 BR371033	RES FILM 100R 0,6F MRS25	4			R112,R131,R132,R133	
36	5,000	ST	21 BR361852	RES WIREW 0R1 2	4			R113,R125,R126,R127,R128	
37	6,000	ST	21 BR362891	RES FILM 10R0 1,6J PR02	4			R114,R115,R116,R117,R118,	
								R119	
38	2,000	ST	21 BR362905	RES CARB. 12R 1/2JSFR25H	4			R120,R121	
39	1,000	ST	21 BR371025	RES WIREW 1K5 4J	4			R122	
40	1,000	ST	21 BR240169	RES CARB. 33R 1/4J SFR25	4			R124	
41	1,000	ST	21 BR362006	RES SEMIV 10R 1K CERM	4			R134	
42	1,000	ST	25 BR363154	TRAFO 150WPA,T101 PA6150	1			T101	
43	1,000	ST	25 BR363146	TRAFO 150WPA,T102 PA6150	1			T102	
44	1,000	ST	25 BR363138	TRAFO 150WPA,T103 PA6150	1			T103	
45	1,000	ST	25 BR363111	TRAFO 150WPA,T104 PA6150	1			T104	
46	1,000	ST	25 BR363197	TRAFO 150WPA,T105 PA6150	1			T105	
**********	**********	**	**********	********** BILL OF DOCUMENTATION	**********	**********	**********	**********	**********
			BR4400 EC	150W HF-POWER AMP PA6150					
			1636 MM	PTP PA6150. LIN.HF OG PA.					
			3766 PD	POWERAMP. 150W					
**********	**********	**	**********	********** NEXT ASSY **********	**********	**********	**********	**********	**********
	1,000	ST	BR379069	HEATSINK ASSY LEFT PA6150	1				
	1,000	ST	BR379077	HEATSINK ASSY RGHT PA6150	1				

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TITLE: POWERAMP. 150W PA6150 D440

DOCUMENT NO.: 61 - BR363766
(363766

REV: A

SHEET NO.: 2 OF 2

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	36 BR367214	BLOWER 115V 50/60HZ	4			B1	
2	2,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H1	
3	2,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H2	A1
4	2,000	ST	51 BR333425	SCREW M 4 X12 UHJ GULCR	4			H3	
5	2,000	ST	52 BR327506	NUT M 3 M CU SN	4			H4	
6	2,000	ST	52 BR321060	NUT M 4 M CU SN	4			H5	A1
7	2,000	ST	31 BR368490	CONN D ACCESS. LOCK.HOOK	4			H6	
8	1,000	ST	41 BR366951	REAR PLATE PA6150	1			MP1	
9	1,000	ST	53 BR476862	LOCKSPRING	1			MP2	
10	2,000	ST	37 BR369071	COAX CA ASSY W1 PA6150401	3			W1	
11	2,000	ST	37 BR369098	COAX CA ASSY W2 PA6150401	3			W2	
12	1,000	ST	27 BR377171	CABLE ASSY PA6150 1	1			W3	
13	1,000	ST	37 BR377198	CABLE ASSY PA6150 2	1			W4	
14	2,000	ST	53 BR380105	WASHER,FLAT Ø 3MM CU SN M	4				A2
**********	**		**********	********** NEXT ASSY **********				**********	**
	1,000	ST	BR377120	CHASSIS ASSY PA6150	1				

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TITLE: REAR PLATE ASSY PA6150

DOCUMENT NO.: 41 - BR377163 (377163)

REV: A2

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	61 BR363766	POWERAMP.150W PA6150 D440	1			A1	
2	2,000	ST	22 BR361577	DIO ZEN. BZY93C22 22V 20W	4			CR01,CR02	
3	2,000	SE	23 BR363189	DIO ACCESS . MOUNT.KIT	4			H1	
4	6,000	ST	55 BR200387	SPACER Ø3 5X 5MM MEC	4			H2	
5	7,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H3	
6	6,000	ST	51 BR275549	SCREW M 3 X12 CHJ GULCR	4			H4	A2
7	6,000	ST	53 BR321052	WASHER,TOOTH Ø 3,2	4			H5	
8	1,000	ST	56 BR369829	HEATSINK LEFT PA6150	3			MP1	
9	2,000	ST	31 BR379115	TERMINAL LUG F/DIOD ID Ø7	1			MP2	
10	1,000	ST	26 BR362980	TRANS.HIPOW MJE3055 SI-N	4			Q105	
11	2,000	ST	21 BR361860	RES WIREW 15R 25A	4			R111,R135	
12	1,000	ST	21 BR361879	RES WIREW 75R 25A	4			R122	
13	1,000	ST	33 BR363219	SW,THERMO 112C 6 O/O	4			ST1	
14	1,000	ST	37 BR373168	CABLE ASSY PA6150 V	1			W1	
15	1,000	ST	37 BR369101	COAX CA ASSY PA6150	3			W2	
16	2,000	ST	53 202234-002	WASHER DISK 5.2X10X0.5MM	4				A1
17	2,000	ST	53 202234-003	WASHER DISK 6.2X13X0.7MM	4				A1
18	1,000	ST	56 301201-003	INSULATOR, PLATE, MICA	4				A2
19	1,000	ST	53 202234-030	WASHER DISK 3.2X 8X0.5MM	4				A2
**********	**********	**	**********	*** BILL OF DOCUMENTATION	**********	**********	**********	**********	**********
			BR22253/22254 MM	PTP PA6150.MONT KØLEFINNE					
**********	**********	**	**********	********** NEXT ASSY **********	**********	**********	**********	**********	**********
	1,000	ST	BR444065	POWERAMP 250W PA6150 D481	1				

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TITLE: HEATSINK ASSY LEFT PA6150

DOCUMENT NO.: 56 - BR379069 (379069)

REV: A2

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	61 BR363766	POWERAMP.150W PA6150 D440	1			A1	
2	2,000	ST	23 BR361577	DIO ZEN. BZY93C22 22V 20W	4			CR01,CR02	
3	2,000	ST	23 BR363189	DIO ACCESS MOUNT.KIT	4			H1	
4	6,000	ST	56 BR200387	SPACER Ø3 5X 5MM MEC	4			H2	
5	7,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H3	
6	6,000	ST	51 BR275530	SCREW M 3 X10 CHJ GULCR	4			H4	A2
7	6,000	ST	53 5R321052	WASHER,TOOTH Ø 3,2	4			H5	
8	1,000	ST	56 BR360837	HEATSINK RIGHT PA6150	3			MP1	
9	2,000	ST	31 BR379115	TERMINAL LUG F/DIOD ID Ø7	1			MP2	
10	1,000	ST	26 BR362980	TRANS.HIPOW MJE3055 SI-N	4			Q105	
11	2,000	ST	21 BR361860	RES WIREW 15R 25A	4			R111,R135	
12	1,000	ST	21 BR361879	RES WIREW 75R 25A	4			R122	
13	1,000	ST	33 BR363219	SW,THERMO 112C 6 0/0	4			ST1	
14	1,000	ST	37 BR373141	CABLE ASSY PA6150 H	1			W1	
15	1,000	ST	37 BR363101	COAX CA ASSY PA6150	3			W2	
16	2,000	ST	53 202234-002	WASHER DISK 5.2X10X0.5MM	4				A1
17	2,000	ST	53 202234-003	WASHER DISK 6.2X13X0.7MM	4				A1
18	1,000	ST	56 201201-003	INSULATOR, PLATE, MICA	4				A2
19	1,000	ST	53 202234-030	WASHER DISK 3.2X 8X0.5MM	4				A2
**********	**********	**	**********	********** BILL OF DOCUMENTATION	**********	**********	**********	**********	**********
			BR#2253/22254 MM	PTP PA6150.MONT KØLEFINNE					
**********	**********	**	**********	********** NEXT ASSY **********	**********	**********	**********	**********	**********
	1,000	ST	BR444065	POWERAMP 250W PA6150 D481	1				

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TITLE: HEATSINK ASSY RGHT PA6150

DOCUMENT NO.: 56 - BR379077 (379077)

REV: A2

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR442402	PWB, INPUT SPLITTER PA6150	3				
2	1,000	ST	22 BR366617	CAP. CER. 15P 100 G NPO	4			C525	
3	1,000	ST	22 BR366625	CAP. CER. 10P 100 G NPO	4			C526	
4	1,000	ST	31 BR358665	COAX CONN SMB FEM-PWB	4			J4	
5	4,000	ST	31 BR264768	CONN, FLAT, PWB 6,3X0,8	1			J5, J6, J7, J9	
6	1,000	ST	31 BR369276	CONN TAB F/PWB	4			J9	A1
7	6,000	ST	31 BR387355	CONN MOLEX 6P MALE	4			J1A, J1B, J2A, J2B, J3A, J3B	
8	1,000	ST	21 5R240222	RES CARB. 100R 1/4J SFR25	4			R525	
9	1,000	ST	21 BR240486	RES CARB. 3K3 1/4J SFR25	4			R526	
10	1,000	ST	25 BR366633	TRAFO INP.SP, T525 PA6150	1			T525	
11	1,000	ST	25 BR366641	TRAFO INP.SP, T526 PA6150	1			T526	
12	0,700	M	32 200843-009	WIRE COP TIN-CTD Ø0.6 MM	4				A1
13	1,000	ST	45 BR371157	STRAP, CABLE L 92XB2,6	4				A1
*****	**********	--	**********	***** BILL OF DOCUMENTATION	**	**********	**********	**********	*****
			BR442372 PD [illegible]4621 TP	INPUT SPLITT.PA6150 KVAITETSSIKRING.					
*****	**********	--	**********	********* NEXT ASSY *******	**********	**********	**********	**********	*****
	1,000	ST	BR444065	POWERAMP 250W PA6150 D481	1				

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TITLE: INPUT SPLITT.PA6150 D4809

DOCUMENT NO.: 60 - BR442372
(442372)

REV: A1

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR479888	PWB,POWER COMBINER PA6150	3				
2	2,000	ST	22 BR361909	CAP. PLST 10N 1K K	4			C1, C2	
3	1,000	ST	22 BR462772	CAP. SEM 5-60P TEFLON	4			C3	
4	3,000	ST	22 BR357642	CAP. CER. 10N 100 S HI-K	4			C4, C5, C6	
5	1,000	ST	23 BR228079	DIO SIGN. BAV 10 SI 600MA	4			CR1	
6	1,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H1	
7	1,000	ST	52 BR327506	NUT M 3 M CU SN	4			H2	
8	1,000	ST	53 BR336874	WASHER,FLAT Ø 3MM CU SN	4			H3	
9	4,000	ST	45 BR371157	STRAP,CABLE L 92XB2.6	4			H4	
10	10,000	ST	31 BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			H5	
11	1,000	ST	25 BR479926	COIL PA6150 COMB. L1	1			L1	
12	1,000	ST	46 BR372277	BRACKET,3XCOAX CON.PA6150	1			MP1	
13	5,000	ST	21 BR362379	RES OXIDE 510R 7J	4			R1, R2, R3, R4, R5	
14	2,000	ST	21 BR241628	RES CARB. 4K7 1/2JSFR25H	4			R6, R7	
15	2,000	ST	21 BR240400	RES CARB. 1K0 1/4J SFR25	4			R8, R9	
16	1,000	ST	25 BR480061	TRAFO COMB.T1 PA6150	1			T1	
17	1,000	ST	25 BR366447	TRAFO COMB.T2 PA6150	1			T2	
18	1,000	ST	24 BR484555	IC LIN 4N32 OPTOCOUPL.	4			U1	
19	1,000	ST	37 BR452742	CABLE ASSY MR6000-01	1			W1	
20	0,090	M	32 200843-009	WIRE COP TIN-CTD Ø0.6 MM	4				A1
**********			**********	*** BILL OF DOCUMENTATION	**			**********	*****
			BR479896 EC	POWER COMB PA6150					
			BR479896 PD	POWER COMB PA6150					
			MR004622 TP	KVALITETSSIKRING.					
**********			**********	********** NEXT ASSY **********				**********	**********
	1,000	ST	BR444065	POWERAMP 250W PA6150 D481	1				

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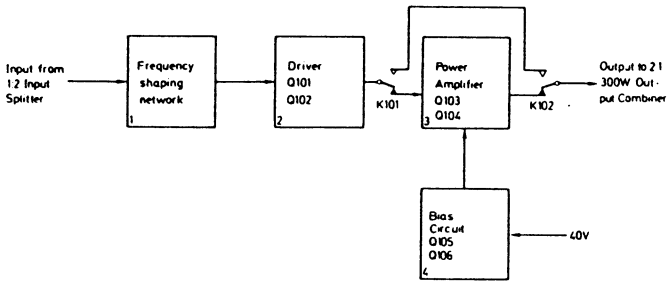
TITLE: POWER COMB PA6150 300W

DOCUMENT NO.: 61 - BR479896 (479896

REV: A1

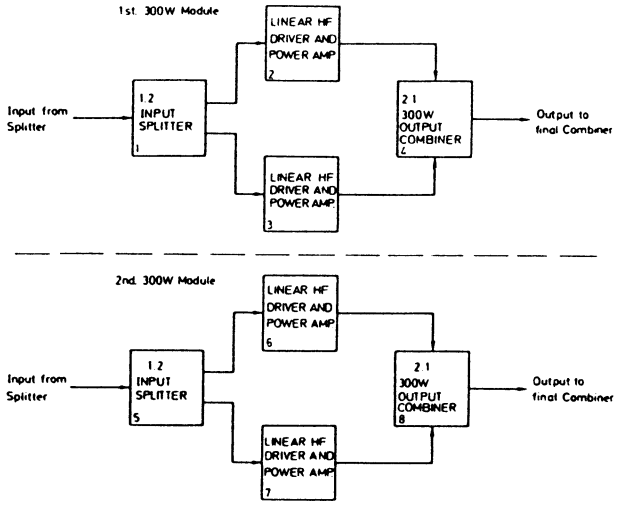
SHEET NO.: 1 OF 1



Block Diagram 150-W Power Amplifier

PA 6150 DIAG No. 4444

Ref. Designation 4444



Block Diagram 500-W PA Panel

PA 6150 DIAG No. 4445

Ref. Designation 4445

Note 1:

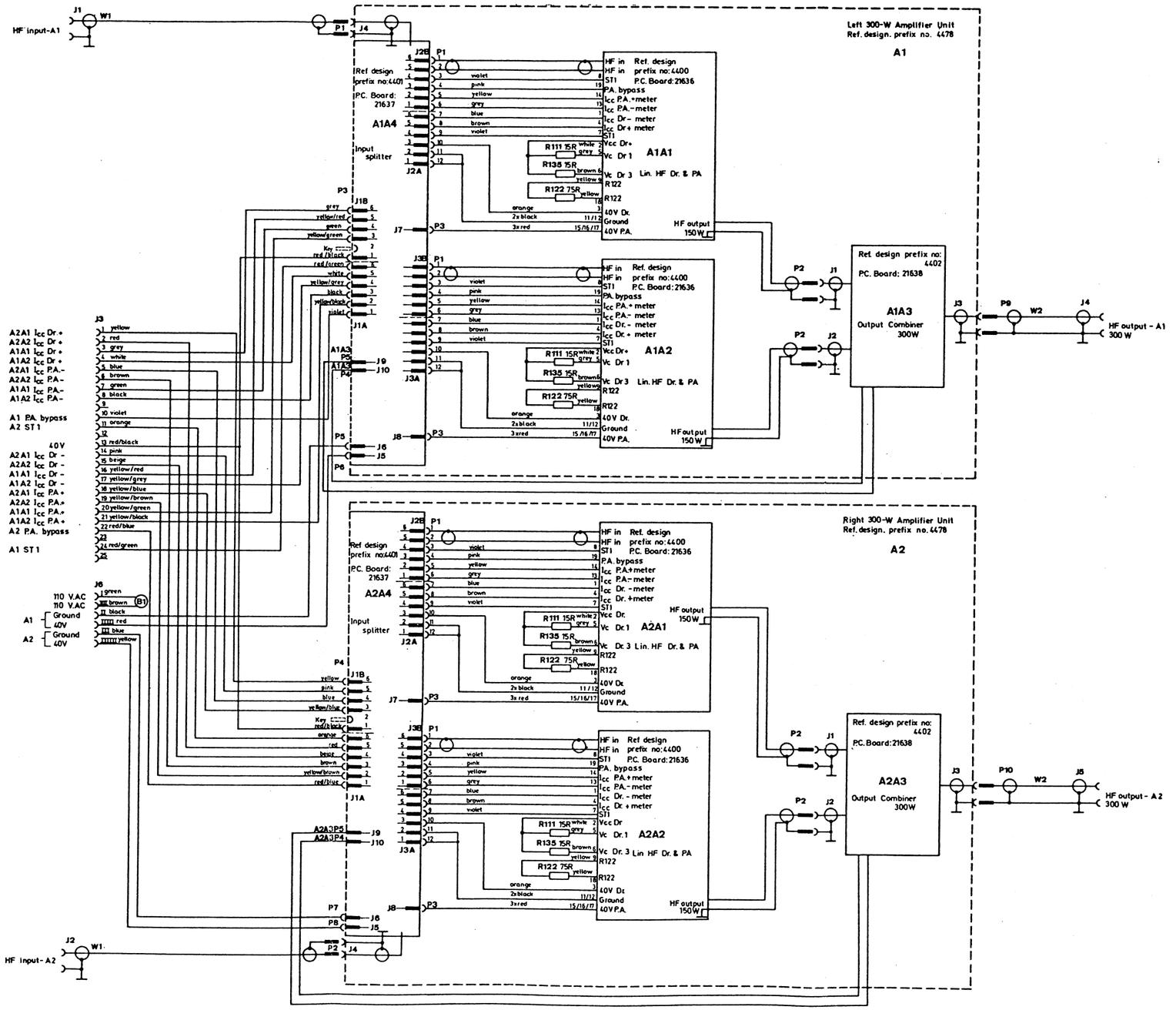
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and µ, (pF, nF, and µF).

The inductance units are indicated by means of the international prefixes µ, and m, (µH, and mH).



500-W PA Panel

Ref. Designation 4416

Note 1:

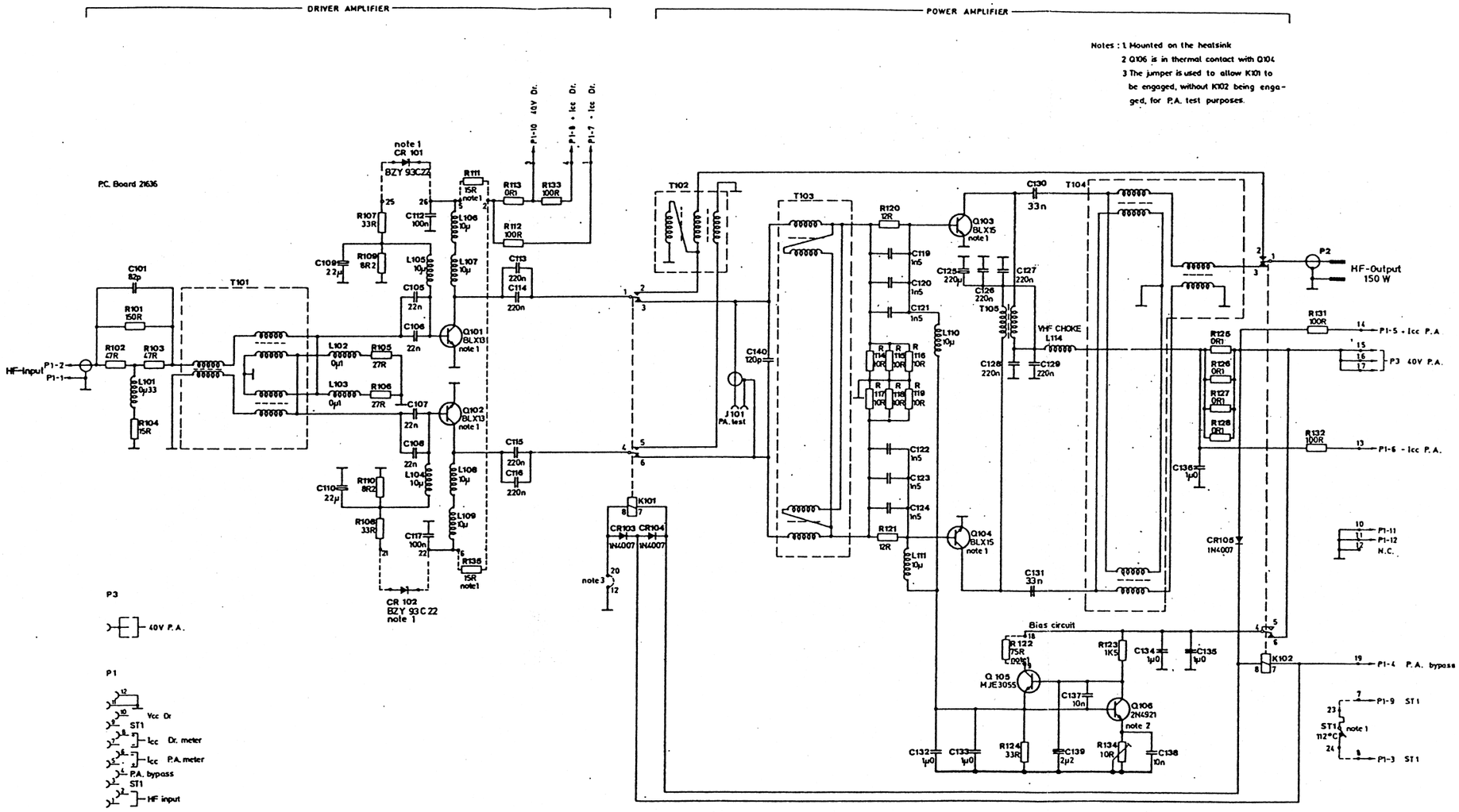
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and µ, (pF, nF, and µF).

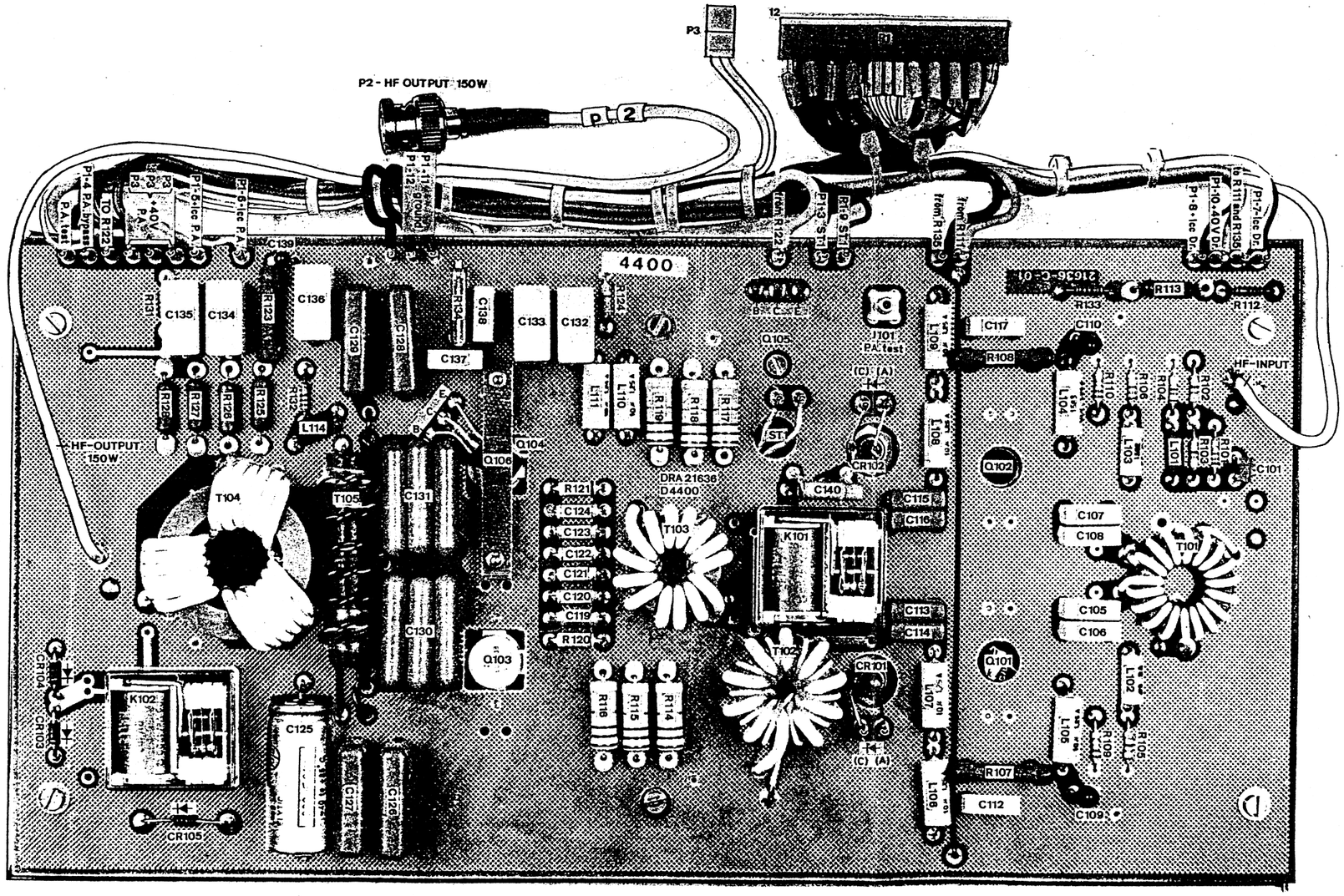
The inductance units are indicated by means of the international prefixes µ, and m, (µH, and mH).



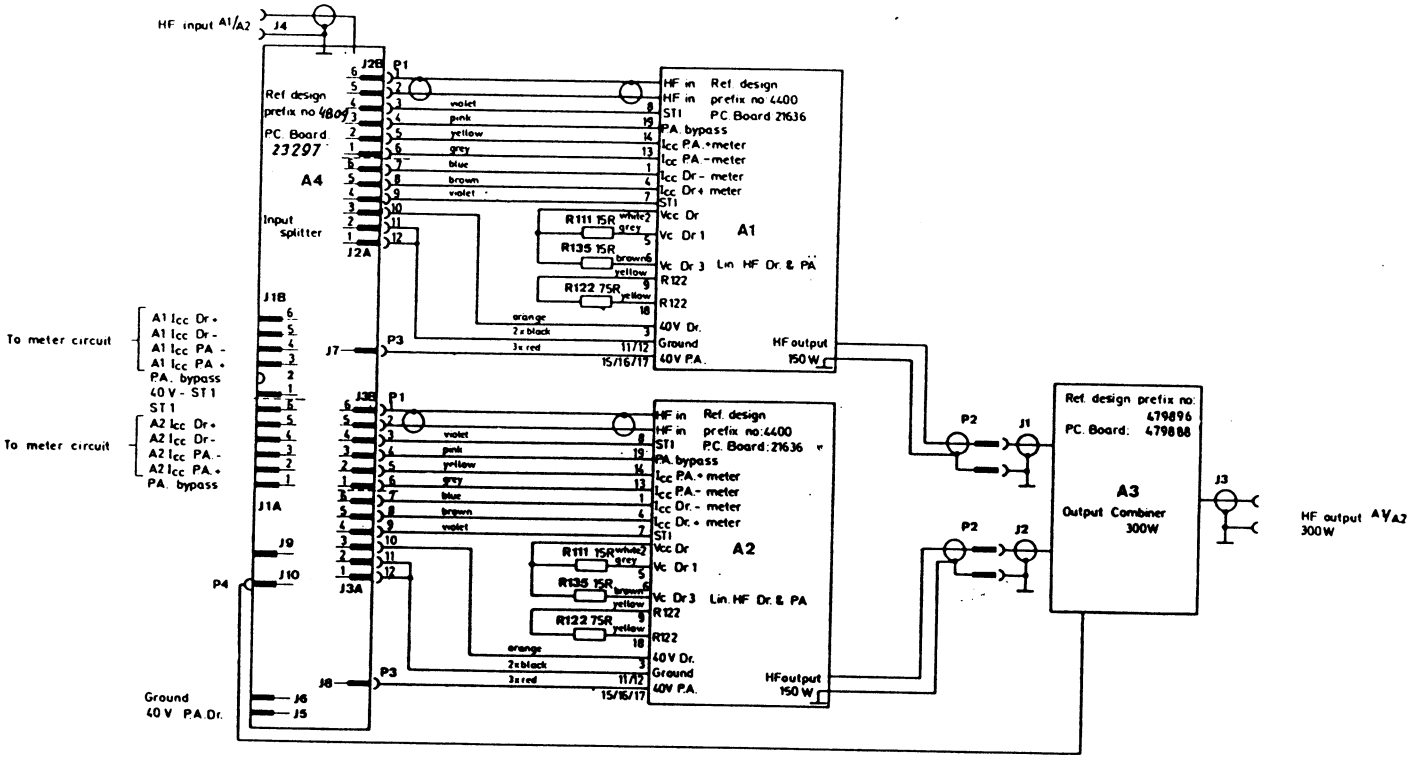
PA 6150 DIAG No. 4400

150-W Power Amplifier

Ref. Designation 4400



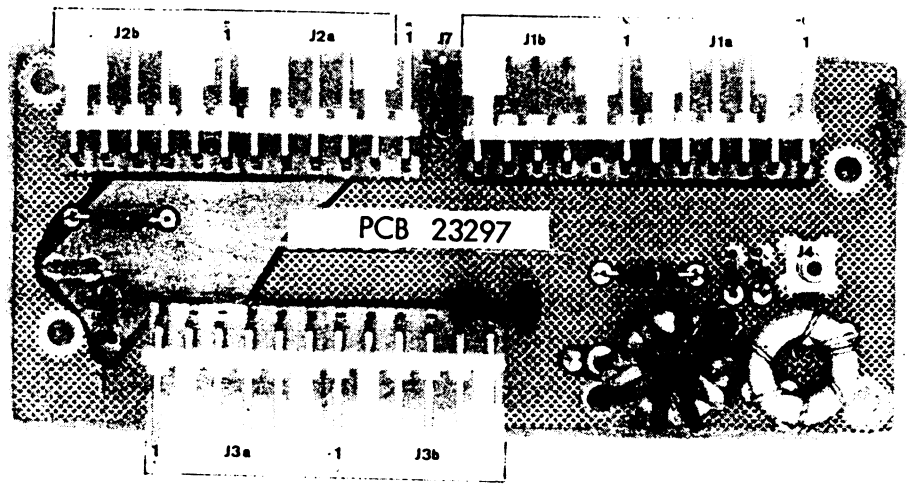
150-W Power Amplifier
Ref. Desig. 4400
Component Location



PA 6150 DIAG No. 4478 / 1985-11

300-W Amplifier Unit

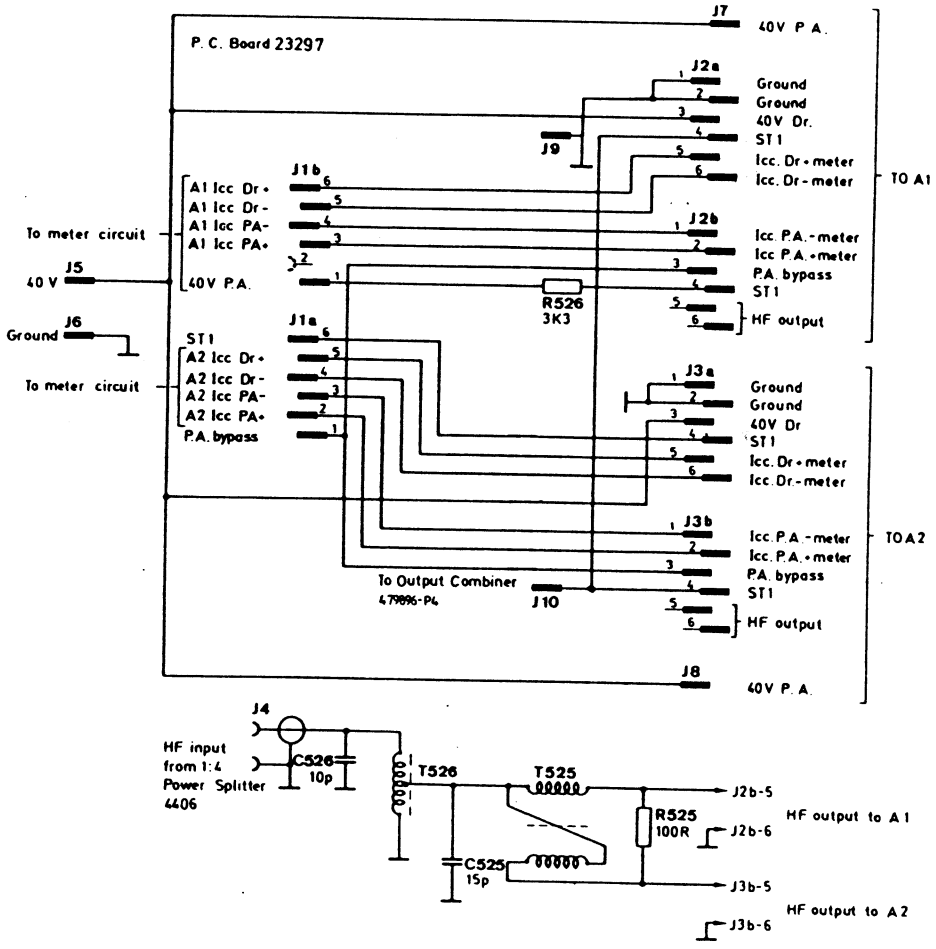
Ref. Designation 4478



Input Splitter

Ref. Desig. 4809

Component Location

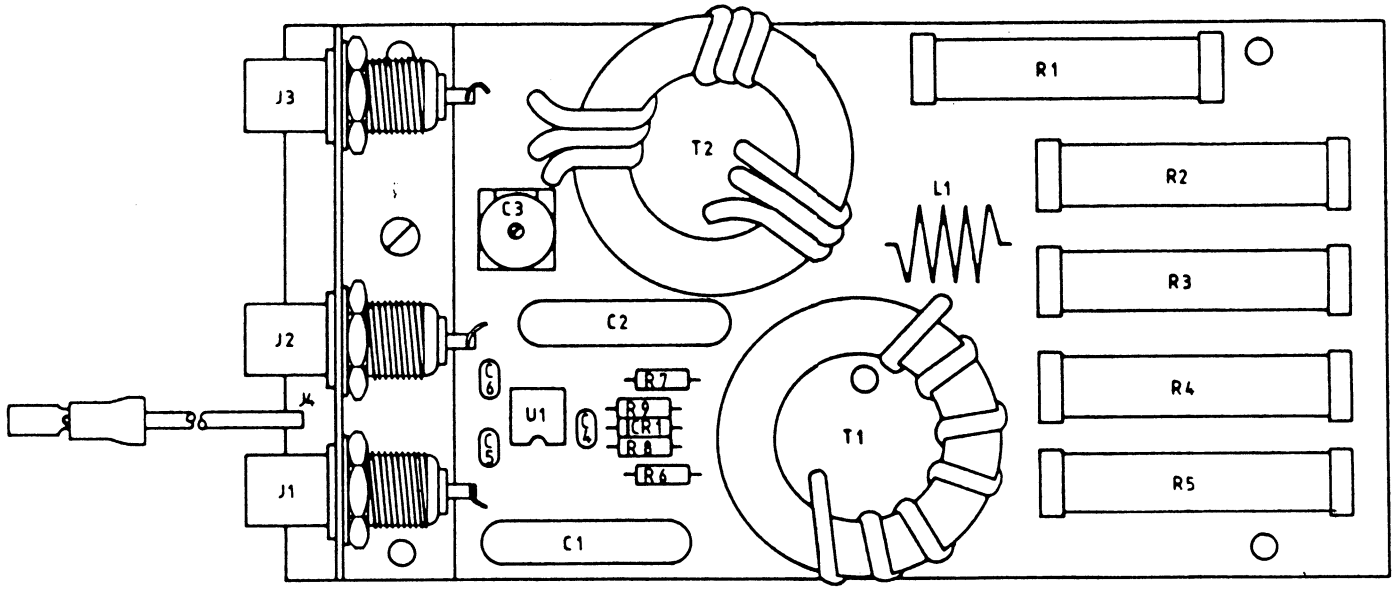


INPUT SPLITTER

PA 6150 DIAG. No. 4809/ 1985-11

(Ref. Desig. 4809)

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075	
		ANGLES	
		LIN. DIM.	
44 40 65	PA 6150	MATERIAL	
NEXT ASSY	USED ON		
APPLICATION			

DR.	V.H	10 4 1985
CH.	RW	850410
AP.		
AP.		

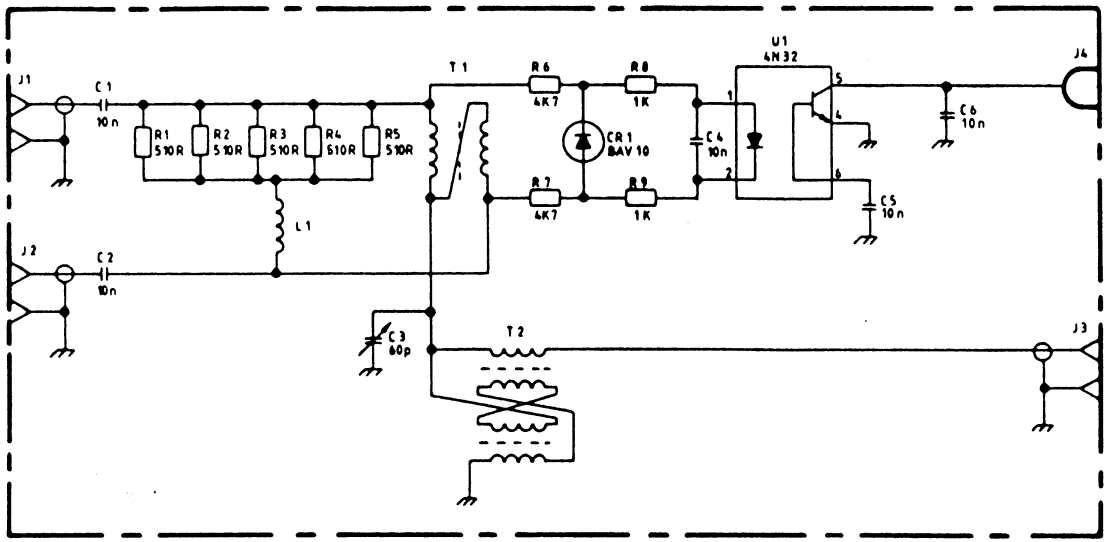
FIRST ANGLE PROJECTION

Dansk Radio AS

TITLE
COMPONENT LOCATION
300W POWER COMBINER

SIZE	CODE IDENT	DRAWING NO
A2		47 98 96
SCALE 2 1		SHEET 1 OF 1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075		Dansk Radio AS
			DR. V.H. 10.4 1985	TITLE: 300W POWER COMBINER
		ANGLES	CH. RW 850410	
		LIN. DIM.	AP.	
			AP	
44 40 65	PA 6150	MATERIAL	FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO 47 98 96
NEXT ASSY	USED ON			SCALE / SHEET 1 OF 1
APPLICATION				

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SECTION 1. - TECHNICAL SPECIFICATIONS

General:

The CF 6150 is a combination and filter panel designed to be used as part of the HF SSB/ISB transmitter S 76150-1.

The CF 6150 has several functions vital to the transmitter system.

1. Combination of the two 300-W signals to form the 500 W output.
2. Harmonics filtering of the combined output.
3. 3 dB attenuator in circuit at high SWR and during automatic coupler tuning.
4. Detection of forward and reflected power at the output for standing wave ratio computation and automatic level control system. Computation of the standing wave ratio at the load (antenna).
   These measurements together with the P.A. supply voltage, P.A. output stage current, P.A. driver stage current are displayed by the front panel instruments with associated instrument switches.
5. Necessary interface between the power amplifier part of the transmitter and the synthex SE 4010, i.e. the combined synthesizer and exiter.
6. Error detection of faulted P.A. modules, switching off associated signal and power input lines.

HF Input: 2 x 300 W approx.

Harmonic HF Filters: 8 low-pass filters

Filter Shift freq.: (1.5), 2.3, 3.3, 4.8, 6.8, 10.0, 14.3, 21.0, (30.0) MHz

Harmonic Attenuation:
2nd harmonic more than 25 dB
3rd harmonic more than 40 dB

HF Output: 500 W

Cooling: Built-in fan with stop detector.

Measurement Outputs:

Forward Power:	500 W	9.8 V, sq. root law
Reflected Power:	50 W	3.3 V, sq. root law
SWR:	" "	10 V, lin.with refl.coef.

Measurement Inputs:

$I_{CC\ PA}$:	12 A FSD	100 mV/100 ohms
$I_{CC\ Dr}$:	3 A FSD	100 mV/100 ohms
$V_{supp.}$:	60 V FSD	60 V/60 kohms

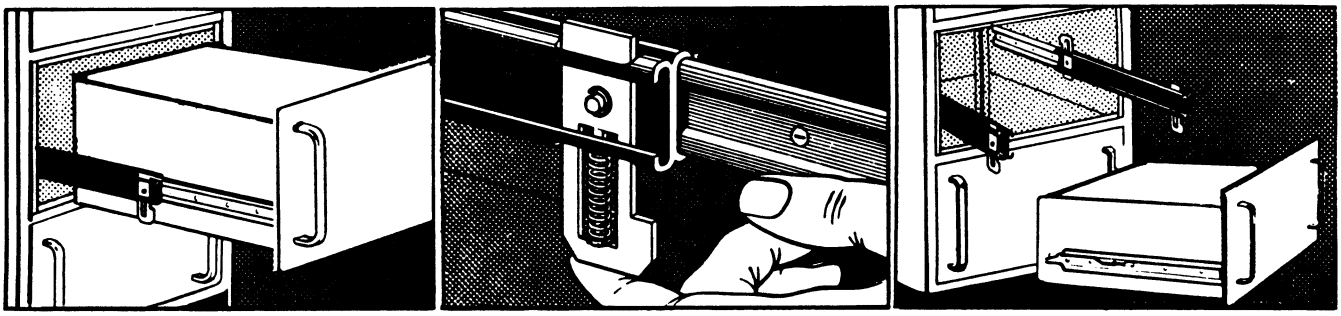
Measurement Accuracy:	Voltage +/- 1.5% FSD +/- 2.5% ASD Current +/- 1.5% FSD +/- 2.5% ASD Power +/- 1.5% FSD +/- 8.5% ASD SWR +/- 1.5% FSD +/- 8.5% ASD
Supply:	+40 V DC from PA supply 115 V AC from PA supply
Environmental conditions:	Operating Temperature: -15°C to +55°C Storage Temperature: -40°C to +70°C Relative Humidity: 95% at 40°C Shock and vibration: According to MIL 810 B
Dimensions:	Panel width: 19" (483 mm) Panel height: 180 mm Panel depth: 470 mm
Weight:	31 kg approx.

SECTION 2. DESCRIPTION

2.1. Mechanical Description

The combination and filter panel-and-chassis assembly (drawer) is designed to be mounted on telescopic slides in a standard 19-inch cabinet rack.

The front panel is fastened to the cabinet rack by means of captive panel-mounting screws. The telescopic slides are fitted with trigger latches which automatically and securely lock the unit in the withdrawn position, when fully extended. The projecting latches are pressed (see drawing) to release the lock so that the drawer can be closed or completely removed from the cabinet rack. Before removing a drawer from the cabinet all plugs on the rear panel should be taken out of their sockets.



The chassis together with the top cover make an extremely rigid construction.

The front panel carries the switches and meters. The air-inlet for the cooling air is located on the right-hand side of the front panel.

The rear panel carries the fan and input and output connections.

For location of the separate circuits, see chapter 9.3.

2.2. Electrical Description

2.2.1. Description of Block Diagrams

2.2.1.1. Description of Combination and Filter Assembly CF 6150. Block Diagram No. 4469

In the 500 W transmitter, the S 76150, the combination and filter unit CF 6150 combines the two 300 W inputs, provides filtering and performs a number of logical and monitoring functions.

Signal Path

The block diagram shows how the two 300 W inputs are fed to the 500 W combiner. The output of the 500 W combiner is then fed to the filter bank which consists of eight low-pass filters. The filters are switched in according to the frequency transmitted. The filters have an output for termination of third harmonic signal content into a 50 ohm dissipation load, thus preventing third harmonic radiation.

The filtered signal continues to the 3-dB attenuator control. Here are two possibilities, either the signal is fed right through without attenuation or the signal is attenuated 3 dB in the attenuator. During tuning when the transmitter is used with an automatic antenna tuner the signal is attenuated.

The attenuator is also used when there is a mismatch at the transmitter output. The 3-dB attenuator is controlled from the synthex.

The signal is fed from the 3-dB attenuator control through the directional coupler to the output terminal.

Control and Monitoring Circuits

Error Logic

The error logic contained in the same block as the SWR computer receives its inputs from the 500 W output combiner and from two sets of thermo switches placed on the PA6150 300 W modules.

Two detectors in the 500 W combiner sense whether all the 300 W modules are providing their share of the total output. If one of the 300 W modules is faulty, the error logic will shut down the DC power to that module via one of the two control lines to the power supply. If the temperature of one of the 300 W modules is too high, the thermo switch on that 300 W module will inform the error logic, and DC power to that module will shut down.

SWR Computer

The directional coupler feeds two RF signals to the SWR computer, one of which is proportional to the forward part of the output voltage and one which is proportional to the reflected part of the output voltage.

Both signals are fed to detectors in the SWR computer block, and outputs from both are fed to the meter switch circuits for monitoring. The forward detector output is also fed to the synthex for the ALC. The SWR computer calculates the SWR irrespective of the output level and provides an output voltage analog to the standing wave ratio. This voltage is fed to the meter switch circuits for monitoring the SWR, and to the synthex for control purposes.

Monitoring of Currents and Voltages

Inputs to the meter switch circuits from all the amplifiers and drivers of the PA 6150 provide monitoring of the current of the driver transistors, the power amplifier transistors and the DC voltage to each 150-W amplifier.

Power Regulator

The power regulator supplies the necessary DC voltages to the SWR computer and the meter switch circuits from the +40 V DC input.

Blower Control

The blower control part of the 3-dB attenuator and blower control block provides an interlock function on the cooling air system in the CF 6150. In case of too little air through the panel, the power to the transmitter will be switched off.

2.2.1.2. Description of the Filter Bank Block Diagram 4452

The filter bank is included in the transmitter to suppress second and third harmonics from the output of the transmitter.

The filter bank is made up of 8 low-pass filters which are designed to operate in the ranges described on the block diagram.

To achieve a better suppression of the third harmonics, the filters have been extended to include a high-pass section, which passes the third harmonic on to a 50 ohm load.

The switching of the filters is determined by the frequency selection on the synthex.

2.2.1.3. Description of CF 6150 Front Panel Block Diagram No. 4470

The front panel carries a lot of switching functions to make it possible for the operator or technician to obtain information on the status of the transmitter.

Three of the functions are supplied in order to monitor the performance of the transmitter output. That is "Forward Power", "Reflected Power" and "SWR".

In the block diagram the DC voltage analog to the SWR is fed to the meter amplifier U1, the output of which is fed to M1 through one of the meter switches. The output from the meter amplifier is also fed to the synthex where it is used to regulate the output of the transmitter down in case of high standing wave ratios.

Voltages proportional to forward and reflected power are supplied to the meter switches and presented on M2. The active detector U1 used for the forward voltage is necessary because the detector in the SWR computer is fast.

The remaining switches are used for monitoring the voltage, the current in the driver transistors and the current in the PA transistors on each power amplifier printed circuit boards. A 500-W transmitter consists of 4 PA PCBs.

The last block (5) is a fan stop detector. As the name indicates its function is to detect whether the fan is working or not. If the fan stops, the fan stop detector will stop the transmitter.

2.2.1.4. Description of SWR Computer/Error Logic. Block Diagram 4446.

Error Logic

The Error Logic is included in the transmitter to protect the output transistors of the 300 W modules from damage due to output mismatch and overtemperature.

In this text the 300 W modules are named according to their position in the panel.

The detectors in the 500 W Combiner are connected in such a way that two of them provide a DC output voltage proportional to the output of each of the two 300 W modules. These inputs to the Error Logic are named Upper Left, Upper Right.

During normal conditions all the detector inputs have the same value, approx. +10 V DC at 1000 W out, thus the difference-amplifier outputs are zero. If a difference exists between two inputs the output will differ from zero corresponding to the input difference. When the difference in two corresponding inputs is at a preset value, the comparator will change state, indicating a fault. Say that the 300 W module Upper Right goes low, then the input named Upper will also go "low, due to the gate board circuit.

Through the Logic this activates the Relay Driver named Upper Right, this resulting in the DC power to the 300 W module being shut off.

Included in the Error Logic is protection against overtemperature in the 300 W modules. The inputs named "Thermo-switch" inputs are connected to thermo switches mounted on the cooling fins of the 300 W modules. The inputs are normally at "1". At overtemperature the inputs go to "0", this resulting in the corresponding Relay Driver being activated, shutting down the DC power to the 300 W module in question.

SWR Computer

The SWR-Computer is an analogue calculator, which calculates the SWR irrespective of the output level of the transmitter. The HF voltages corresponding to the forward and reverse voltages are detected in the HF detectors, which are followed by buffers. The DC voltages named Forward output and Reverse output are used for monitoring and for the ALC.

The SWR computer consists of an integrator which integrates the forward DC voltage until the voltage at the output of the integrator is equal to the reverse voltage at the other input of the comparator. When the two inputs are equal the comparator changes state, resetting the flip-flop which in turn resets the integrator.

The clock generator "sets" the flip-flop, the comparator "resets" the flip-flop.

Thus it is seen that the time from "set" to "reset" depends upon the relative amplitudes of the forward voltage and reverse voltage. This means that the output from the flip-flop is a pulse with modulated square voltage, which is used to drive the output amplifier, the output of which in turn drives the meter amplifier on the Meter Switch Board.

2.2.1.5. Description of the Power Regulator CF 6210/CF 6150 Block Diagram 4453.

The power regulator supplies the necessary DC voltages to the active circuits in the CF 6210 or CF 6150.

The +5 V and the +15 V are supplies from ordinary integrated circuit regulators which in turn are fed from +40 V DC via dropping resistors.

To be able to supply a negative voltage without using a transformer, the -9,0 V DC is derived from the +40 V DC which is chopped by Q1, rectified and finally regulated by Q2.

2.2.1.6. Description of the 3-dB Attenuator and Blower Control Circuit Block Diagram No. 4468

The board carries two different circuit blocks.

The interlock block (1) controls the primary power to the +40 V power supply. Activation of the "RF on" switch on the synthex results in a connection to the power supply which delivers +40 V to the power amplifiers. If the fan in the CF 6150 is not functioning, the fan stop detector input to the block switches the power supplies off.

The 3-dB attenuator control has two functions. During tuning of the automatic antenna tuner the output power is routed via the 3-dB attenuator to protect the output transistors.

In case of very high SWRs the 3-dB attenuator is also switched in series with the output to protect the output transistors. In both cases the 3-dB attenuator control is switched from the synthex.

2.2.2.1. Interconnections. Reference Designation 4461

Diagram No. 4461 shows the interconnections in the 500-W combination and filter panel. Apart from diagram Nos. each block in the diagram has been provided with a letter and figure identification to allow references on the jacks and plugs, i.e. looking at the lower right-hand corner of the diagram at the 27 dB directional coupler, this is assigned a diagram No. which is 4441 and a location No. which is A6.

The following jack numbers are located at the rear panel of the combination and filter panel: J6, J7, J1, J2, J4, J5, J10.

To identify the location of the blocks, see section 9.3 photos, and section 3.1 and 3.2 which show front and rear panel.

2.2.2.2. Filter Bank (Reference Designations 4414 and 4415)

The filter bank consists of eight identical filter sections all built-up of one low-pass filter and one high-pass filter. As a function of frequency, one of the eight sections is selected and switched in series with the output. The sections are used in a range of frequencies indicated on the circuit diagram,

Looking at filter no.1, coils L1, L2, L3 and capacitors C5-C30 form the low-pass filter. Coil L4 and capacitors C1-C4 form the high-pass filter. The low-pass filter has a cut-off frequency of 2.3 MHz, which means that the attenuation of harmonics is high even at the lowest operating frequency. The high-pass filter has its cut-off frequency adjusted in such a way that the third harmonic from the power amplifier can be terminated in a 50-ohm resistor via P3.

The switching in and out of the eight sections is accomplished by applying a ground to P4 pin 1 to 8. This is normally applied from the synthex.

The filter bank is mounted in a shielded box, a part of the combination and filter panel assembly.

The filters are mounted on two identical PCBs. The relays are mounted on two pairs of PCBs, one set on either side inside the shielded box. This box is divided in two parts, an upper and a lower part.

2.2.2.3. Front Panel Circuits (Reference Designation 4448)

The front panel circuits are built up of two PCBs: PCB 22235 and PCB 22236.

Several monitoring functions are included, i.e. current in the PA transistors, current in the driver transistors, standing wave ratio, DC voltage supplied to the PA PCBs, P forward and P reflected.

The shunt resistors for current measurements are located on the PA printed circuit boards. The inputs from these are connected to pins nos. 5 through 20, which means that S7-S10, i.e. the switches marked 1-4 on the front panel, select which PA printed circuit board the measurement is performed upon. Whether the measured current is PA or driver is selected by S5 and S6 on PCB 22235. These switches are marked "I_{CC}PA" and "I_{CC}Dr". The voltage measurement is performed on the current input lines through series resistors R6, R7, which means that the voltage is measured on the same PA-PCB as the current measurement. This switch, S3 of PCB 22235, is marked V_{supp}.

The voltage analog to the SWR is fed to pin No. 7 of PCB 22235, amplified by three by means of U1a and fed to M1 via series resistor R2. DC return for the meter is via R1. An output for the synthex is provided through low-pass filter L1, C9.

U3 pin	1	2	3	4	5	6	8	9	10	11	12	13
Logic level	"0"	"0"	"1"	"0"	"1"	"0"	"0"	"0"	"1"	"0"	"1"	"0"
U4 pin	1	2	3				8	9	10			
Logic level	"1"	"1"	"0"				"1"	"1"	"0"			

If for example the detector connected to J1 pin 23 changes its voltage approx. 4 V compared to the detector connected to pin 11, indicating a fault on the 300-W module called lower right, the detector connected to pin 24 which is measuring the combined signal from the lower power amplifier panel, will also change its level by the same voltage.

This means that the table will change as follows, when a fault exists on lower right:

U3 pin	1	2	3	4	5	6	8	9	10	11	12	13
Logic level	"0"	"0"	"1"	"0"	"0"	"1"	"1"	"1"	"0"	"1"	"0"	"0"
U4 pin	1	2	3				8	9	10			
Logic level	"1"	"1"	"0"				"1"	"0"	"1"			

Pin 10 goes to a high level supplying current to the relay driver Q1, and the relay in the power supply will switch off the +40 V DC to the 300-W module. The same procedure can apply to the rest of the detector inputs. Which input and output that correspond to one another is shown on the diagram.

Detectors for forward and reflected power consist of U10 and U11. The first half of the two detectors are equal. R42, R43, R31,32 are 50-ohm terminations for the directional coupler. CR7, CR9 together with the rest of the resistors and capacitors form a peak detector, the load of which is held low by means of the integrated amplifiers U11, U10. By using diodes in the feed-back of amplifiers U10, U11 first half the transfer-characteristics of the detectors have been made virtually linear. Outputs to metering circuits are provided at J1 pins Nos. 14 and 1. At rated output from the transmitter the output from the forward detector will be 10 V DC. The second half of U10 and U11 are used to buffer the outputs to the SWR computer. U11 second half is coupled as an active detector with fast attack, slow release characteristics.

The SWR computer consists of the following active elements: U12, U13, U14, U15, Q5, Q6, Q7, Q8, Q9. The forward signal is integrated by the integrator built around U12 and C28, the output of which is compared with the reflected signal at pin 3 of U13. When the two are equal in amplitude U13 will switch from high to zero output. This will reset U14 so that pin 12 goes high resetting the integrator via Q7 and Q6 which operates as a switch across the integrator U12. The transistors Q8 and Q9 are functioning as a clock generator for the computer. U15 is a multivibrator providing the set pulses to the set-reset flip-flop U14.

The output pulses from U14 will thus be pulsewidth modulated, the negative part increasing for a higher standing wave ratio.

Q5 serves to adjust the output level from the computer. Typical waveforms are shown below:

2.2.2.6. Power Regulator. Reference Designation 4405

The purpose of the power regulator is to supply the necessary DC voltages to the SWR computer board Ref. Desig. 4407 and the meter switch board Ref. Desig. 4410. The necessary voltages are +15 V, +5 V, -9 V.

To avoid a transformer in the circuit all voltages are taken from the +40 V DC, which is supplied from the main power supplies.

+15 and +5 V are supplied from ordinary integrated power regulators, the input of which is kept below the maximum allowed value by means of the voltage divider R6, R7, R8, R9. C4-C7 ensure the stability of the integrated regulators.

In order to provide a negative voltage the +40 V is chopped by Q1. The input to Q1 is taken from a multivibrator on the SWR computer board. The chopped voltage is rectified in a voltage doubler CR1, CR2, C1 and C2 and stabilized by an ordinary series stabilizer Q2.

2.2.2.7. 500-W Output Combiner. Reference Designation 4439

The 500-W combiner is located inside the 500-W combiner channel on the right-hand side of the CF 6150.

J6 and J7 are located on the rear panel of the CF 6150. J3 is located on the 500-W combination channel.

The inputs from J6 and J7 are parallel-combined by T1, the output impedance of which is 25 ohms. The 25-ohms impedance is transformed into a 50-ohm impedance by T2. C4, C5, C8 are high frequency compensating capacitors. R3 is a parallel-connection of ten 1-kohm resistors, which with air-cooling give a total rating of approx. 150 W. When only one 300-W input is present this resistor must dissipate 150 W.

Each 300-W input is connected to a detector circuit, which consists of a capacitive voltage divider, e.g. C6, C7, dividing the voltage by approx. 15, a diode CR2, a parallel resistor R4 and a filtering network R5, C9. The output is fed to the error logic.

2.2.2.8. 3-dB Attenuator and 50-ohm, 50-watt Load. Reference Designation 4408

The 3-dB attenuator and 50-ohm 50-W load circuit performs two functions

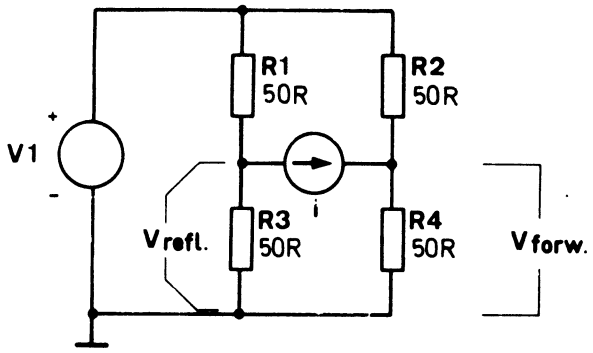
In the first place it functions as a 50-ohm termination for the third harmonic output from the power amplifiers. The third harmonic content in the output is filtered from the output in the filter unit and fed to J6 on the PCB where four resistors in parallel form a 50-ohm load. These are R828-R831. The capacitor C801 provides a high-frequency compensation.

In the second place the circuit functions as a 3-dB attenuator. The input is to J4, the output taken from J5. The power rating of the attenuator is 250 W. In case of high standing wave ratios the attenuator is connected in series with the antenna, which means that the SWR as seen from the output transistors, will never be higher than 3:1.

The 3-dB attenuator and 50-ohm, 50-W load circuit is inserted in the combination channel of the combination and filter panel.

2.2.2.9. Directional Coupler. Reference Designation 4441

The function of the coupler is easiest to understand when using an equivalent diagram, but first it is necessary to tell that T1 is a voltage transformer and that the winding of T2 is placed around the output lead which means that the transformer is a current transformer. The degree of coupling is approx. 1:22 (-27 dB).



In the equivalent diagram the voltage generator is the voltage transformer T1 and the current generator is the current transformer. R1 and R2 are the built-in 50-ohms resistances, R3 and R4 are external 50-ohms resistances. Since the degree of coupling is approx. 1:22 we find that

$$V_1 = \frac{V_{out}}{22} \quad ; \quad i = \frac{i_{load}}{22}$$

If the transmitter is operated at rated output power and connected to a 50-ohm load, we find that the output voltage is approx. 158 V_{rms}, which means that V_1 is

$$V_1 = \frac{224}{22} = 7,2\ V_{rms}$$

The load current, i_{load}, is approx. 3,16 Amp, which means that:

$$i = \frac{3,16}{22} = 0,144\ A$$

If we use superposition we find that

$$V_{refl} = V_1 \times \frac{50}{50+50} - \frac{i}{2} \times 50 =$$

$$7,2 \times \frac{1}{2} - \frac{0,14}{2} \times 50 = 0$$

and that

$$V_{forw} = V_1 \times \frac{50}{50+50} + \frac{i}{2} \times 50 =$$

$$7,2 \times \frac{1}{2} + \frac{0,14}{2} \times 50 = 7,10\ V_{rms}$$

If the load impedance was say 25 ohms we would find:

$V_l = \sqrt{500 \times 25/22} = 5{,}08\ V_{rms}$ and

$i = \sqrt{\frac{500}{25}} / 22 \quad 0{,}20$ A this resulting in:

$$V_{refl} = 5{,}08 \times \frac{1}{2} - 0{,}20 \times \frac{1}{2} \times 50 = -2{,}46\ V_{rms}$$

$$V_{forw} = 5{,}08 \times \frac{1}{2} + 0{,}20 \times \frac{1}{2} \times 50 = 7{,}54\ V_{rms}$$

which is a voltage ratio in dB approx. equal to 10 dB which is the return loss equivalent to a standing wave ratio of 2.

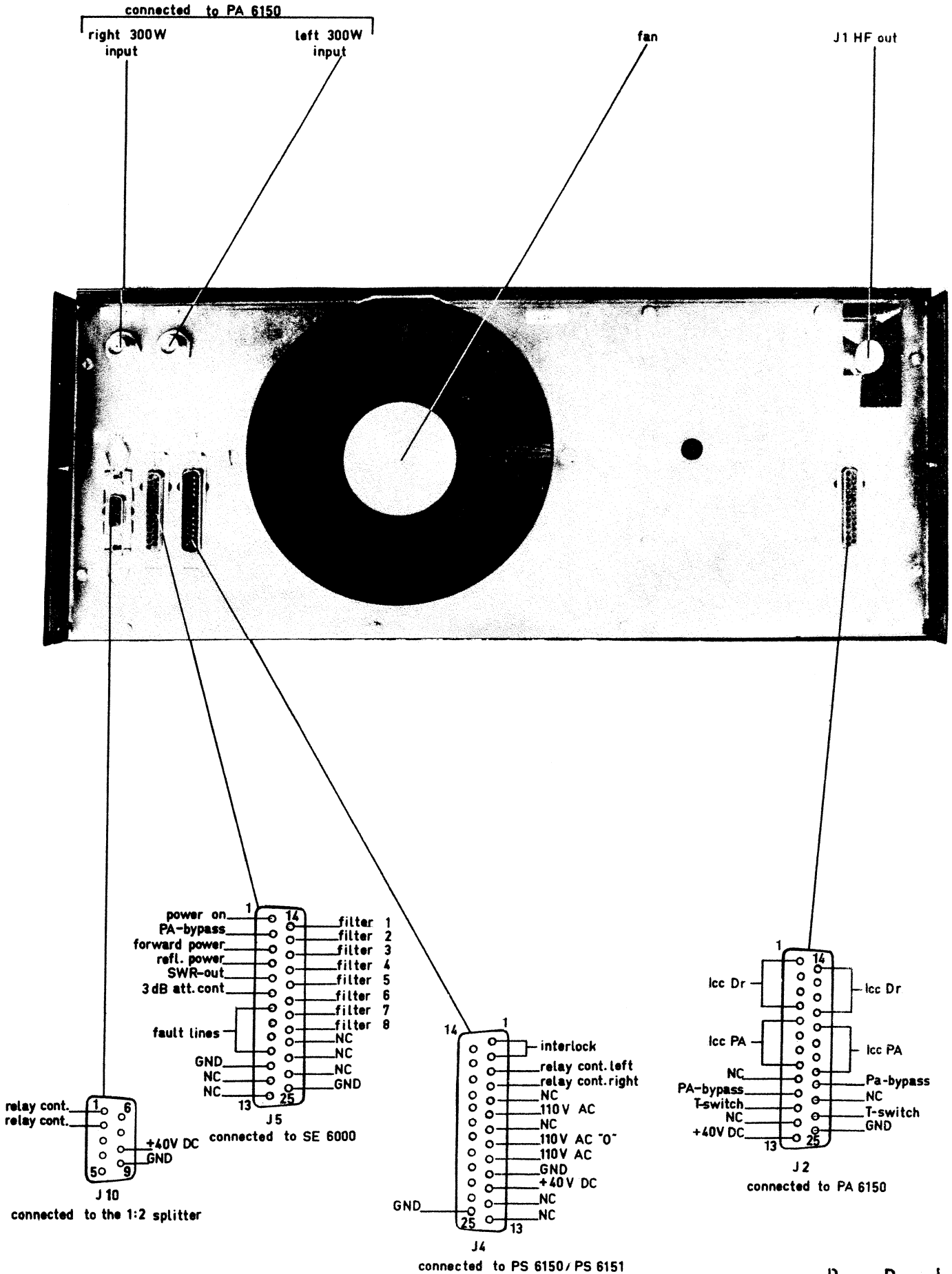
2.2.2.10. Gate Board. Reference Designation 4451

The gate board is mounted on top of the 500-W combination channel in the CF 6150.

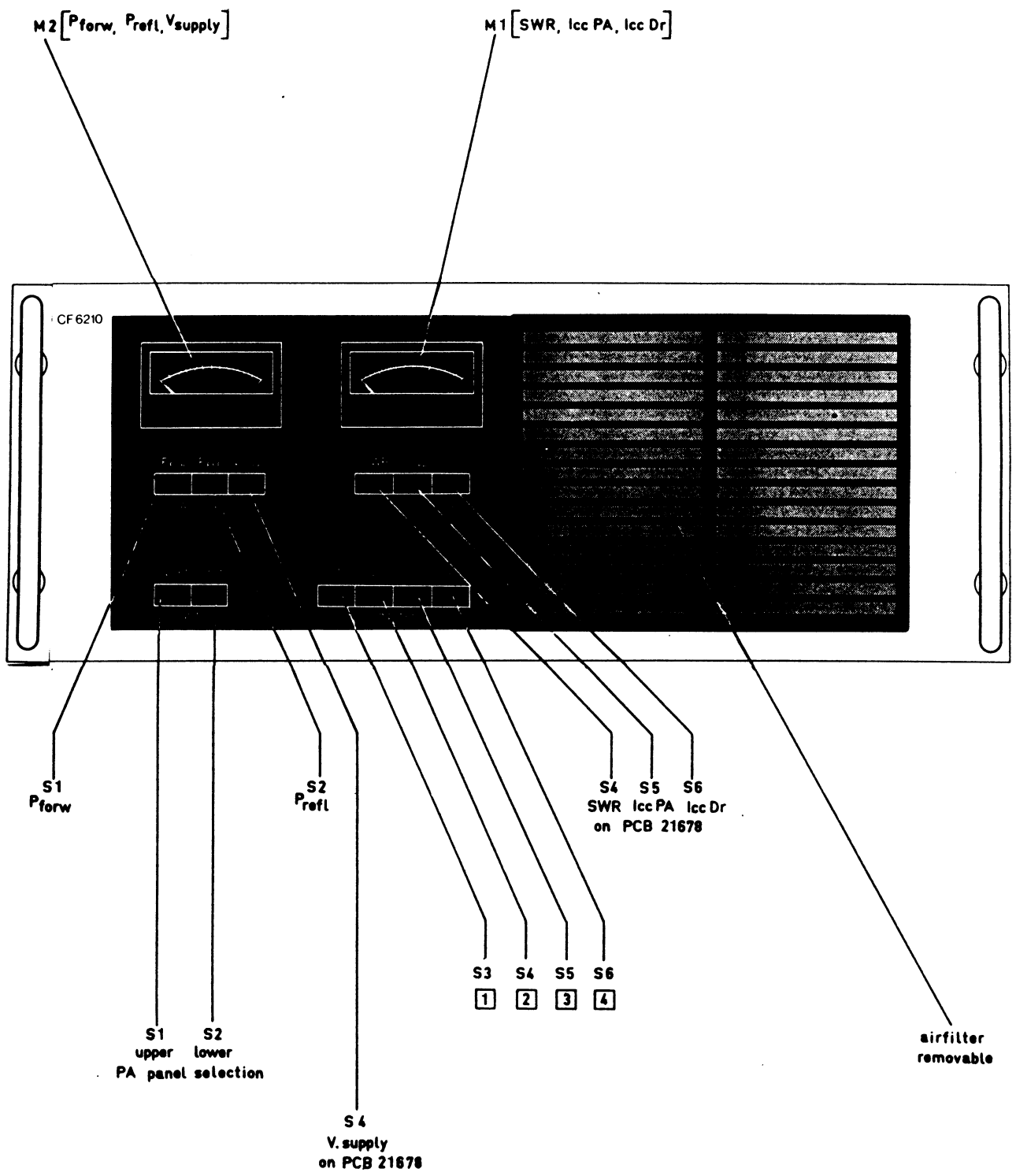
The circuit is included in the CF 6150 to allow the same SWR computer and error logic circuit as in the 1000-W transmitter to be used.

The input to pin 1 is +15 V DC from J2 pin 3 at the SWR computer. Pin 5 provides a logical "1" to J2 pin 24, which is the same as telling the logic that the non-existing power amplifier panel is working properly. Pins 2 and 4 are connected to the relay outputs of the error logic, i.e. a +40 V DC when the transmitter is working properly. This means that pin 3 will be at +15 V DC. Pin 3 is connected via J2 pin 12 to the other common detector input and a balance exist in the error detector circuit, in this case U6 in the SWR computer diagram No. 4407. If a fault occurs during operation on one of the 300-W modules, either pin 2 or pin 4 will go low, which means that pin 3 will go low, and thus the error logic will switch off the faulted 300-W module.

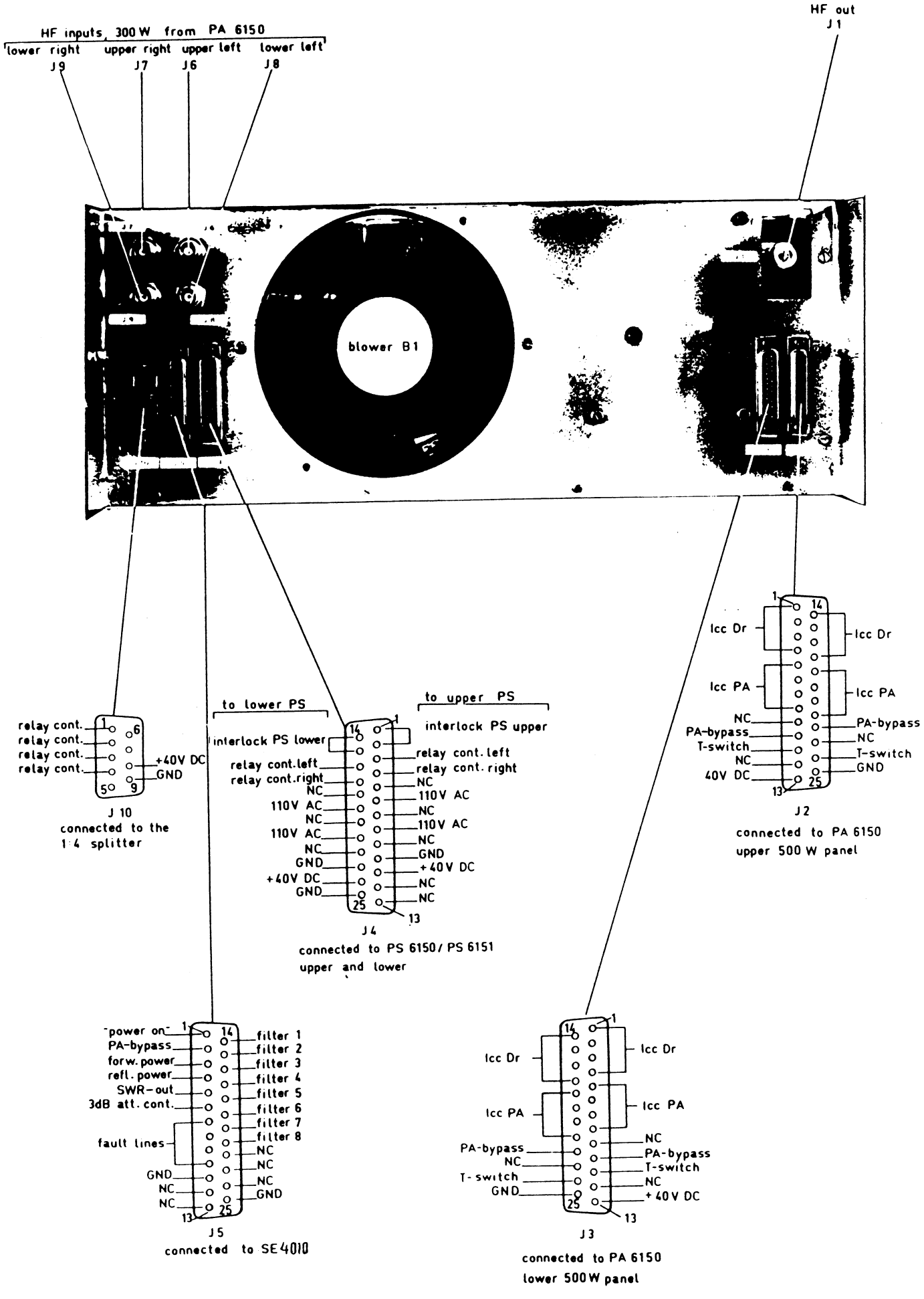
There is, however, one problem with this way of using the same error logic, which will be appreciated by reading the description of diagram No. 4407. If the thermo switch in one of the 300-W modules is activated, either pin 2 or 4 will go low, pulling pin 3 low as well but the detector inputs to pins Nos. 13 or 25 will be low, this resulting in both 300-W modules being switched off. When resetting it is necessary to reset both at the same time, if the transmitter is not providing an output.



Rear Panel
Ref. Desig. 4461



Front Panel
Ref. Desig. 4410



Rear Panel
Ref. Desig. 4418

3.2

SECTION 4. - INSTALLATION.

Please refer to section 4 - S76210.

SECTION 5. OPERATING INSTRUCTIONS

The front panel is shown in section 3.1.

The operation of the CF 6150 is limited to various monitoring functions.

M1	Shows the standing wave ratio, the current in the selected PA transistors Icc PA, or the current in the driver transistors Icc Dr. Range for SWR is from 1-∞ , range for Icc PA is from 0 to 12 Amps, range for Icc Dr is from 0 to 3 Amps.
M2	Shows the output forward power, P_{for}, the reflected power P_{ref}, or the DC voltage supplied to the selected power amplifier printed circuit board.
P_{for}	Selects that the forward power to the antenna is shown on M2.
P_{ref}	Selects that the reflected power from the antenna is shown on M2.
V_{supp}	Selects that the DC voltage supplied to the power amplifier printed circuit board is shown on M2.
SWR	Selects that the standing wave ratio is shown on M1.
Icc PA	PA transistor current is measured on M1.
Icc Dr	Driver transistor current is measured on M1.
1 2 3 4	The button pressed indicates on which power amplifier printed circuit board the measurements are performed.

SECTION 6. MAINTENANCE

General

The combination and filter panel is delivered properly adjusted from the factory. This factory-adjustment will last for a considerable time and a complete new realignment should not be necessary unless a fault has been rectified. Only qualified personnel with use of adequate test equipment must perform this adjustment.

WARNING: High voltage hazard exist when the top cover is removed.

6.1. Alignment Procedure

4414/15 Filter Bank

Test equipment:
Network analyzer or spectrum analyzer with tracking generator and directional coupler, frequency range 100 KHz to 110 MHz.

40 V Power Supply.

Step 1.

The filter bank is removed from the combination and filter panel. +40 V DC is connected to P4, pin 9. Now the filter that needs adjustment can be activated by connection the other lead from the power supply to pin Nos. 1-8.

Step 2.

The tracking generator output is connected to the input plug, P1. The input jack of the spectrum analyzer is connected to the output plug, P2. P3, which is the 3rd harmonic output plug, is terminated in a 50-ohm resistor.

Step 3.

Depending on which filter is adjusted the two frequencies of very high attenuation is adjusted to the frequencies given below. The highest frequency is adjusted by one of the following coils, L3,7,11, 15,19,23,27,31. The lower frequency by L2,6,10,14,18,22,26,30.

Filter No.	Higher Freq. (MHz)	Lower Freq. (MHz)
1	4,3	3,4
2	6,1	4,95
3	8,3	7,15
4	12,0	10,0
5	17,7	14,5
6	26,6	21,7
7	38,7	31,7
8	48,6	48,6

The coils of the low range filters are adjusted by moving the tap on the coil. The higher ranged filter coils are simply pulled more or less apart.

Step 4.

The test equipment is connected to measure return loss on the input plug of the filter bank. The output plug of the filter bank is terminated in a 50-ohm resistor, with a return loss of at least 40 dB. As measured at the input the return loss in the pass-band of the appropriate filter must be at least 22 dB. The pass-band is given in the table below. If the values shown do not hold, coils L1,5,9,13, 17,21,25,29 must be adjusted. It may be necessary to readjust the two coils already adjusted to reach the 22 dB return loss.

The third harmonic range must have a min. return loss of 10 dB. If this is not the case coils L4,8,12,16,20,24,28,32 must be adjusted. The third harmonic output range is also shown in the table below.

Filter No.	Pass-band (MHz)	Third harm. (MHz)
1	1.5 - 2.3	4.5 - 6.9
2	2.3 - 3.3	6.9 - 9.9
3	3.3 - 4.8	9.9 - 14.4
4	4.8 - 6.8	14.4 - 20.4
5	6.8 - 10.0	20.4 - 30.0
6	10.0 - 14.3	30.0 - 42.9
7	14.3 - 21.0	42.9 - 63.0
8	21.0 - 30.0	63.0 - 90.0

Step 5.

The test equipment is reconnected for measurement of transmission content. Attenuation on the lowest second harmonic frequency is checked for a min. of 25 dB. A table of lowest second harmonics is given below.

Filter No.	Second harm. (MHz)
1	3.0
2	4.6
3	6.6
4	9.6
5	13.6
6	20.0
7	28.6
8	42.0

If the table values do not hold, adjustment for the lower high attenuation frequency must be repeated.

478865 SWR Computer.

Test equipment:
Signal generator 1-30 MHz.
Amplifier capable of delivering 1 W 1-30 MHz.
Power splitter 1:2.
Calibrated attenuator.

Step 1.

The SWR-computer is left in the combination and filter panel, this means that no external power supply is needed because the built-in panel supply provides the necessary DC voltages.

The signal generator is connected to the amplifier which feeds the 1:2 power splitter. One output from the power splitter is fed to the forward input jack of the SWR-computer, J2. The other output is fed via the calibrated attenuator to the reflected input jack, J1.

Step 2.

The transmitter is switched on, without being keyed. RF is applied to J1 and J2, the attenuator is set to 0 dB, the meter on the front panel must show ∞ , if this is not the case R25 should be adjusted.

Step 3.

The attenuator is switched to 20 dB, the meter must show 1.2, if this is not the case, R42 must be adjusted.

Step 4.

The attenuator is switched to 6 dB. The meter shall now show 3.0. If this is the case, adjustment is concluded, if not, a fine adjustment of R25 may be necessary.

4403 Directional Coupler

Test equipment:
None for on-site adjustment. This adjustment is used on-site if a misalignment is suspected on the directional coupler.

Step 1.

Run the transmitter with continuous output, read reflected power on the meter, adjust C603 for min. reading with the transmitter operating into a suitable dummy load.

The trimmer capacitor C603 can be reached through a hole in the rear panel of the combination and filter panel.

6.2. Preventive Maintenance

The preventive maintenance on the CF 6210/CF 6150 is limited to renewing the air-inlet filters when necessary or every 3000 hours.

If the filter is too dirty, the fan stop detector will switch off the power supply.

PARTS LIST

PRINTET..... 90/04/26

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	65 BR366579	FILTER 1-4-5-8 CF6- D4414	1			A1	
2	2,000	ST	69 BR364851	RELAY B CF6... D4415	1			A2,A5	
3	2,000	ST	69 BR364843	RELAY A CF6... D4414	1			A3,A6	
4	1,000	ST	65 BR366587	FILTER 2-3-6-7 CF6- D4415	1			A4	
5	162,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H1	A2
6	3,000	ST	51 BR275530	SCREW M 3 X10 CHJ GULCR	4			H2	
7	2,000	ST	51 BR275646	SCREW M 4 X10 CHJ GULCR	4			H3	
8	2,000	ST	52 BR327506	NUT M 3 M CU SN	4			H4	
9	1,000	ST	31 BR231118	TERMINAL LUG 3,25MM	4			H5	
11	14,000	ST	75 BR217832	RUBBER SLV 8X10X14X8	4			H7	
14	3,000	ST	56 BR210862	CLAMP	4			H10	
15	1,000	ST	56 BR211192	CLAMP 3MM	4			H11	
16	2,000	ST	41 BR366927	PLATE F.FILTER CF6150-621	1			MP1	
17	2,000	ST	46 BR365785	BAR F.FILTER CF6150-621	1			MP2	
18	1,000	ST	46 BR373834	U-BAR F. FILTER CF6150-62	1			MP3	
19	1,000	ST	46 BR373842	U-BAR F.FILTER CF6510-621	1			MP4	
20	40,000	ST	56 BR375098	SPACER F.HF-FILTER CF6150	3			MP5	
21	2,000	ST	46 BR373826	U-BAR F.FILTER CF6150-621	1			MP6	
22	2,000	ST	41 BR367486	FRONT/BACK F.FL CF6150	1			MP7	
23	2,000	ST	41 BR367494	SIDE PLATE F.FILTER CF615	1			MP8	
24	1,000	ST	41 BR367508	TOP PLATE F.FILTER CF6150	1			MP9	
25	44,000	ST	52 BR269611	STAY NUT M3 X10 N7	3			MP10	
26	1,000	ST	37 BR368970	COAX CA ASSY CF6150-621	3			W	
27	1,000	ST	37 BR368997	COAX CA ASSY CF6150-621	3			W	
28	1,000	ST	37 BR369012	COAX CA ASSY CF6150-621	3			W	
29	1,000	ST	37 BR378666	CABLE ASSY CF6150-6210	1			W	
30	1,000	ST	56 BR211230	CLAMP	4				A2
31	2,000	ST	31 BR327646	KABELSKO 4MM2	4				A2
32	1,000	ST	56 BR211192	CLAMP 3MM	4				A2
33	2,000	ST	56 BR211214	CLAMP 4,5MM	4				A2
**********	**********	**	**********	********** BILL OF DOCUMENTATION	**	**********	**********	**********	**********
			BRQA4651 TP	4415/4416 S76210/S76150					
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	**********

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TITLE: FILTER BANK CF6150-621

DOCUMENT NO.: 65 - BR364878 (364878)

REV: A2

SHEET NO.: 1 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/04/26

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
	1,000	ST	BR444030	PANEL CF6210-01 COMB. & FL	1				
	1,000	ST	BR444073	PANEL CF6150-01 EMK	1				
	1,000	ST	BR475424	DEPOT SPARES KIT, S76...	1				

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TITLE: FILTER BANK CF6150-621

DOCUMENT NO.: 65 - BR364878 (364878)

REV: A2

SHEET NO.: 2 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR365750	PWB,POWER REGL. CF6150-62	3				
2	2,000	ST	22 BR203572	CAP. ELEC 22U 64 T LL	4			C1,C2	
3	1,000	ST	22 BR209317	CAP. ELEC 10U 64 T LL	4			C3	
4	2,000	ST	22 BR209503	CAP. PLST 470N 100 K	4			C4,C6	
5	2,000	ST	22 BR202967	CAP. PLST 100N 100 K	4			C5,C7	
6	2,000	ST	23 BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR1,CR2	
7	1,000	ST	23 BR228788	DIO ZEN ZPD10 10V 0.5W	4			CR3	
8	2,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H1	
9	2,000	ST	52 BR327506	NUT M 3 M CU SN	4			H2	
10	2,000	ST	53 BR336874	WASHER,FLAT Ø 3MM CU SN	4			H3	
11	1,000	ST	26 BR331449	TRANS.ACCESS HEATSINK	4			H4	
12	2,000	ST	24 BR362069	IC ACCESS HEATSINK	4			H5	
13	2,000	ST	26 BR391387	TRANS.ACCESS ISOLAT.PLD	4			H6	
14	1,000	ST	26 BR218944	TRANS.ACCESS PAD TO-5	4			H7	
15	8,000	ST	31 BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			H8	
16	7,000	ST	31 BR369276	CONN TAB F/PWB	4			H9	
17	1,000	ST	25 BR357723	COIL,CHOKE 100U J	4			L1	
18	1,000	ST	26 BR359440	TRANS.DARLN BD 677 SI-N T	4			Q1	
19	1,000	ST	26 BR273570	TRANS.HIPOW 2N4036 SI-P T	4			Q2	
20	1,000	ST	21 BR324221	RES CARB. 2K4 1/4J SFR25	4			R1	
21	2,000	ST	21 BR367982	RES OXIDE 430R 7J	4			R2,R11	A1
22	1,000	ST	21 BR240109	RES CARB. 10R 1/4J SFR25	4			R4	
23	1,000	ST	21 BR240427	RES CARB. 1K5 1/4J SFR25	4			R5	
24	2,000	ST	21 BR367990	RES OXIDE 390R 7J	4			R6,R7	
25	2,000	ST	21 BR242381	RES FILM 510R 1.6J PR37	4			R8,R9	
26	1,000	ST	21 BR240303	RES CARB. 300R 1/4J SFR25	4			R10	
27	1,000	ST	24 BR362115	IC LIN 78 15 VOLT REGL.	4			U1	
28	1,000	ST	24 BR362085	IC LIN 78 05 VOLT REGL.	4			U2	
**********	**********	**	**********	**** BILL OF DOCUMENTATION	**	**********	**********	**********	******
			BR4405 EC	POWER REGULATOR					
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	******
	1,000	ST	BR364835	COMBINER/ANT.ATT. CF6210	1				

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TITLE: POWER REGL. CF6... D4405

DOCUMENT NO.: 61 - BR364886 (364886)

REV: A1

SHEET NO.: 1 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
	1,000	ST	BR444081	COMB1-2-ANT.ATT CF6150-01	1				

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TITLE: POWER REGL. CF6... D4405

DOCUMENT NO.: 61 - BR364886 (364886)

REV: A1

SHEET NO.: 2 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR376035	PWB,ATT+BLW.CTRL CF6150	3				
2	1,000	ST	22 BR209678	CAP. PLST 100N 400 K	4			C1	
3	2,000	ST	23 BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR1,CR2	
4	18,000	ST	31 BR369276	CONN TAB F/PWB	4			H1	
5	4,000	ST	56 BR200395	SPACER Ø3 5X 6MM MEC	4			H2	
6	1,000	ST	31 BR268364	COAX CONN N FEM-CHASS.	4			J1	
7	1,000	ST	33 BR363170	RELAY 24V 740 2XCHG.	4			K1	
8	2,000	ST	33 BR363162	RELAY 42V 2K8 1XCHG.	4			K2,K3	
9	1,000	ST	26 BR369462	TRANS.LOPOW 2N2219A SI-N	4			Q1	
10	1,000	ST	21 BR240222	RES CARB. 100R 1/4J SFR25	4			R1	
11	1,000	ST	21 BR328596	RES CARB. 24K 1/4J SFR25	4			R2	
12	1,000	ST	37 BR368989	COAX CA ASSY CF6150-621	3			W1	
13	1,000	ST	37 BR368962	COAX CA ASSY CF6150-621	3			W2	
14	1,000	ST	37 BR378860	COAX CA ASSY W3 CF6210615	3			W3	
**********			**********	********** BILL OF DOCUMENTATION	**********			**********	**********
			BR4434 EC	3DB ATT.& BLOWER CONTROL					
**********			**********	********** NEXT ASSY **********				**********	**********
	1,000	ST	BR444073	PANEL CF6150-01 EMK	1				

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TITLE: ATT+BLOW.CTL CF6150 D4434

DOCUMENT NO.: 60 - BR376051 (376051)

REV: A

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/04/26

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR371920	PWB,FILTER CF6150-621	3				
2	1,000	ST	22 232467-078	CAP. MICA 402P / 1000F	4			C1	B
3	2,000	ST	22 232467-093	CAP. MICA 825P / 1000F	4			C5,C6	B
4	4,000	ST	22 232467-064	CAP. MICA 205P / 1000F	4			C12,C13,C14,C107	B
5	2,000	ST	22 232467-091	CAP. MICA 750P / 1000F	4			C17,C18	B
6	2,000	ST	22 232467-083	CAP. MICA 511P / 1000F	4			C25,C28	B
7	1,000	ST	22 232467-049	CAP. MICA 100P / 1000F	4			C31	B
8	4,000	ST	22 232467-060	CAP. MICA 169P / 1000F	4			C34,C35,C44,C104	B
9	2,000	ST	22 232467-032	CAP. MICA 44P2 / 1000F	4			C39,C40	B
10	1,000	ST	22 232467-033	CAP. MICA 46P2 / 1000F	4			C41	B
11	1,000	ST	22 232467-061	CAP. MICA 178P / 1000F	4			C45	B
12	1,000	ST	22 232467-052	CAP. MICA 115P / 1000F	4			C52	B
13	1,000	ST	22 232467-056	CAP. MICA 140P / 1000F	4			C55	B
14	2,000	ST	22 232467-029	CAP. MICA 38P3 / 1000F	4			C57,C78	B
15	1,000	ST	22 232467-051	CAP. MICA 110P / 1000F	4			C60	B
16	3,000	ST	22 232467-014	CAP. MICA 18P7 / 1000F	4			C65,C66,C67	B
17	2,000	ST	22 232467-041	CAP. MICA 68P1 / 1000F	4			C70,C71	B
18	1,000	ST	22 232467-039	CAP. MICA 61P9 / 1000F	4			C81	B
19	1,000	ST	22 232467-058	CAP. MICA 154P / 1000F	4			C83	B
20	1,000	ST	22 232467-067	CAP. MICA 237P / 1000F	4			C86	B
21	1,000	ST	22 232467-068	CAP. MICA 249P / 1000F	4			C87	B
22	3,000	ST	22 232467-040	CAP. MICA 64P9 / 1000F	4			C91,C92,C93	B
23	2,000	ST	22 232467-070	CAP. MICA 274P / 1000F	4			C96,C97	B
24	1,000	ST	22 232469-042	CAP. PORC 520P / 500G	4			C3	B
25	1,000	ST	22 232469-027	CAP. PORC 120P / 500G	4			C33	B
26	1,000	ST	22 232469-016	CAP. PORC 43P / 500G	4			C59	B
27	1,000	ST	22 232469-031	CAP. PORC 180P / 500G	4			C85	B
28	32,000	ST	54 BR499064	RIVET,TUBULAR 2,25X3,6MM	4			H1	A1
29	2,000	ST	51 BR327174	SCREW M 3 X12 CHM CU SN	4			H2	
30	6,000	ST	51 BR327247	SCREW M 4 X12 CHM CU SN	4			H3	
31	2,000	ST	52 BR327506	NUT M 3 M CU SN	4			H4	
32	18,000	ST	52 BR321060	NUT M 4 M CU SN	4			H5	
33	2,000	ST	53 BR345725	WASHER,PRESSP.Ø 3,2 X 6,0	4			H6	
34	6,000	ST	53 BR341762	WASHER,PRESSP.Ø 5,0 X14,0	4			H7	
35	12,000	ST	53 BR336777	WASHER,FLAT Ø 4MM CU SN M	4			H8	
36	3,000	ST	25 BR365440	COIL CF6... D4414 D4415	1			L1,L2,L3	

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TITLE: FILTER 1-4-5-8 CF6- D4414

DOCUMENT NO.: 65 - BR366579 (366579)

REV: B

SHEET NO.: 1 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/04/26

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
37	1,000	ST	25 BR365459	COIL CF6... D4414 1U43	1			L4	
38	3,000	ST	25 BR365521	COIL CF6... D4414 U72	1			L5,L6,L7	
39	1,000	ST	25 BR365548	COIL CF6... D4414 U33	1			L8	
40	3,000	ST	25 BR365599	COIL CF6... D4414 U24	1			L9,L10,L11	
41	1,000	ST	25 BR365602	COIL CF6... D4414 U11	1			L12	
42	3,000	ST	25 BR365483	COIL CF6... D4414 D4415	1			L13,L14,L15	
43	1,000	ST	25 BR365513	COIL CF6... D4414 U48	1			L16	
**********	**********	**	**********	**** BILL OF DOCUMENTATION	**	**********	**********	**********	******
			BR4414/4415 EC	FILTER BANK CF6210					
			BR4414 PD	FILTER BANK					
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	******
	1,000	ST	BR364878	FILTER BANK CF6150-621	1				

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TITLE:	DOCUMENT NO.:	REV:	SHEET NO.:
FILTER 1-4-5-8 CF6- D4414	65 - BR366579 (366579)	B	2 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/04/26

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR371920	PWB,FILTER CF6150-621	3				
2	2,000	ST	22 232467-072	CAP. MICA 301P / 1000F	4			C109,C213	B
3	2,000	ST	22 232467-083	CAP. MICA 511P / 1000F	4			C113,C123	B
4	1,000	ST	22 232467-082	CAP. MICA 487P / 1000F	4			C114	B
5	2,000	ST	22 232467-056	CAP. MICA 140P / 1000F	4			C118,C119	B
6	1,000	ST	22 232467-057	CAP. MICA 147P / 1000F	4			C120	B
7	1,000	ST	22 232467-084	CAP. MICA 536P / 1000F	4			C124	B
8	1,000	ST	22 232467-075	CAP. MICA 348P / 1000F	4			C131	B
9	1,000	ST	22 232467-079	CAP. MICA 422P / 1000F	4			C134	B
10	1,000	ST	22 232467-040	CAP. MICA 64P9 / 1000F	4			C137	B
11	4,000	ST	22 232467-049	CAP. MICA 100P / 1000F	4			C140,C161,C197,C198	B
12	3,000	ST	22 232467-055	CAP. MICA 133P / 1000F	4			C141,C150,C151	B
13	3,000	ST	22 232467-025	CAP. MICA 31P6 / 1000F	4			C145,C146,C147	B
14	2,000	ST	22 232467-045	CAP. MICA 82P5 / 1000F	4			C158,C176	B
15	1,000	ST	22 232467-034	CAP. MICA 48P7 / 1000F	4			C163	B
16	2,000	ST	22 232467-043	CAP. MICA 75P0 / 1000F	4			C166,C167	B
17	1,000	ST	22 232467-014	CAP. MICA 18P7 / 1000F	4			C171	B
18	1,000	ST	22 232467-017	CAP. MICA 21P5 / 1000F	4			C172	B
19	1,000	ST	22 232467-022	CAP. MICA 27P4 / 1000F	4			C173	B
20	2,000	ST	22 232467-048	CAP. MICA 95P3 / 1000F	4			C177,C199	B
21	1,000	ST	22 232467-036	CAP. MICA 53P6 / 1000F	4			C184	B
22	1,000	ST	22 232467-041	CAP. MICA 68P1 / 1000F	4			C187	B
23	1,000	ST	22 232467-064	CAP. MICA 205P / 1000F	4			C189	B
24	2,000	ST	22 232467-077	CAP. MICA 383P / 1000F	4			C192,C202	B
25	2,000	ST	22 232467-078	CAP. MICA 402P / 1000F	4			C193,C203	B
26	1,000	ST	22 232467-068	CAP. MICA 249P / 1000F	4			C210	B
27	32,000	ST	54 BR499064	RIVET,TUBULAR 2,25X3,6MM	4			H1	A1
28	2,000	ST	51 BR327174	SCREW M 3 X12 CHM CU SN	4			H2	
29	6,000	ST	51 BR327247	SCREW M 4 X12 CHM CU SN	4			H3	
30	2,000	ST	52 BR327506	NUT M 3 M CU SN	4			H4	
31	18,000	ST	52 BR321060	NUT M 4 M CU SN	4			H5	
32	2,000	ST	53 BR345725	WASHER,PRESSP.Ø 3,2 X 6,0	4			H6	
33	12,000	ST	53 BR336777	WASHER,FLAT Ø 4MM CU SN M	4			H7	
34	3,000	ST	25 BR365440	COIL CF6... D4414 D4415	1			L17,L18,L19	
35	1,000	ST	25 BR365475	COIL CF6... D4415 1UO	1			L20	
36	3,000	ST	25 BR365556	COIL CF6... D4415 U52	1			L21,L22,L23	

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TITLE: FILTER 2-3-6-7 CF6- D4415

DOCUMENT NO.: 65 - BR366587 (366587)

REV: B

SHEET NO.: 1 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/04/26

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
37	1,000	ST	25 BR365564	COIL CF6... D4415 U23	1			L24	
38	3,000	ST	25 BR365572	COIL CF6... D4415 U343	1			L25,L26,L27	
39	1,000	ST	25 BR365580	COIL CF6... D4415 U157	1			L28	
40	3,000	ST	25 BR365483	COIL CF6... D4414 D4415	1			L29,L30,L31	
41	1,000	ST	25 BR365491	COIL CF6... D4415 U69	1			L32	
42	1,000	ST	22 232469-039	CAP. PORC 380P / 500G	4			C111	B
43	1,000	ST	22 232469-023	CAP. PORC 82P / 500G	4			C139	B
44	1,000	ST	22 232469-024	CAP. PORC 95P / 500G	4			C165	B
45	1,000	ST	22 232469-034	CAP. PORC 240P / 500G	4			C191	B
46	6,000	ST	53 BR341762	WASHER,PRESSP.Ø 5,0 X14,0	4				B
**********	**********	**	**********	********** BILL OF DOCUMENTATION	**	**********	**********	**********	**********
			BR4414/4415 EC BR4415 PD	FILTER BANK CF6210 FILTER BANK					
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	**********
	1,000	ST	BR364878	FILTER BANK CF6150-621	1				

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TITLE: FILTER 2-3-6-7 CF6- D4415

DOCUMENT NO.: 65 - BR366587 (366587)

REV: B

SHEET NO.: 2 OF 2

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60 BR378682	ANT.ATTENUAT.CF6150 D4441	1			A1	
2	1,000	ST	60 BR364916	COUPLER 2 CF6... D4403	1			A2	
3	12,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H1	
4	9,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H2	A1
5	8,000	ST	51 BR275549	SCREW M 3 X12 CHJ GULCR	4			H3	
6	29,000	ST	52 BR327506	NUT M 3 M CU SN	4			H4	
7	8,000	ST	56 BR200387	SPACER Ø3 5X 5MM MEC	4			H5	
8	1,000	ST	56 BR210730	CLAMP NYLON	4			H6	
9	1,000	ST	31 BR368288	COAX CONN N FEM-CH-ANG	4			J	
10	1,000	ST	41 BR365157	BOX F/DIR COUPLER CF6150-	1			MP1	
11	1,000	ST	41 BR365165	SCREEN BOX F.COUPL. CF615	1			MP2	
12	1,000	ST	25 BR378585	TRAFO T2 CF6150	1			T2	
13	1,000	ST	37 BR378380	COAX CA ASSY W1 CF6150-62	3			W1	
14	1,000	ST	37 BR375055	COAX CA ASSY W2 CF6150-62	3			W2	
15	1,000	ST	37 BR375063	COAX CA ASSY W3 CF6150-62	3			W3	
16	0,150	M	32 BR220116	FLEX SILICONE 3 YEL	4				A1
17	0,100	M	32 BR438227	FLEX TEFLON Ø0,7X Ø1,2	4				A1
18	1,000	ST	75 BR217824	RUBBER SLV 6X9.5X12X8	4				A1
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	**********
	1,000	ST	BR378763	REAR PLATE ASSY CF6150	1				

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TITLE: DIRECTION COUPLER CF6150

DOCUMENT NO.: 60 - BR378593 (378593)

REV: A1

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR378720	PWB,OUTPUTCOMB 500W CF615	3				
2	2,000	ST	22 BR366404	CAP. CER. 5P6 1K J NPO	4			C1,C6	
3	2,000	ST	22 BR209554	CAP. PLST 10N 250 K	4			C2,C9	
4	2,000	ST	22 BR357553	CAP. CER. 82P 100 C N150	4			C3,C7	
5	1,000	ST	22 BR365211	CAP. GLAS 56P 1K J 3A	4			C4	
6	2,000	ST	22 BR365300	CAP. GLAS 27P 1K J 3A	4			C5,C8	
7	2,000	ST	23 BR228087	DIO SIGN. 1N4148 SI 150MA	4			CR1,CR2	
8	3,000	ST	31 BR369276	CONN TAB F/PWB	4			H1	
9	20,000	ST	31 BR231304	TERMINAL STUD 2,5X7 Ø1,3	4			H2	
10	2,000	ST	45 BR378151	STRAP,CABLE L180XB4,8	4			H3	
11	6,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H4	
12	4,000	ST	56 BR211192	CLAMP 3MM	4			H5	
13	2,000	ST	46 BR365793	BRACKET,MOUNT CF6150-621	1			MP1	
14	2,000	ST	21 BR240605	RES CARB. 15K 1/4J SFR25	4			R1,R5	
15	2,000	ST	21 BR240567	RES CARB. 10K 1/4J SFR25	4			R2,R4	
16	10,000	ST	21 BR362387	RES OXIDE 1K 7J	4			R3	
17	1,000	ST	25 BR378623	TRAFO T1 CF6150 OUTPCOM	1			T1	
18	1,000	ST	25 BR378631	TRAFO T2 CF6150 OUTPCOM	1			T2	
19	1,000	ST	37 BR378658	COAX CA ASSY W1 CF6150	3			W1	
20	1,000	ST	37 BR378747	COAX CA ASSY W2 CF6150	3			W2	
21	1,000	ST	37 BR378755	COAX CA ASSY W3 CF6150	3			W3	
**********				********** BILL OF DOCUMENTATION	**********				
			BR4439 EC BR378739 PD	500W COMBINER CF6150 OUTPUT COMBINER					
**********				********** NEXT ASSY **********					
	1,000	ST	BR444081	COMB1-2-ANT.ATT CF6150-01	1				

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TITLE:	DOCUMENT NO.:	REV:	SHEET NO.:
OUTPCOM 500W CF6150 D4439	60 - BR378739 (378739)	A	1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60 BR378593	DIRECTION COUPLER CF6150	1			A1	
2	1,000	ST	36 BR367214	BLOWER 115V 50/60HZ	4			B1	
3	6,000	ST	51 BR275522	SCREW M 3 X 8 CHJ GULCR	4			H1	
4	2,000	ST	51 BR275549	SCREW M 3 X12 CHJ GULCR	4			H2	
5	4,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H3	
6	2,000	ST	51 BR275646	SCREW M 4 X10 CHJ GULCR	4			H4	
7	2,000	ST	51 BR333417	SCREW M 4 X10 UHJ GULCR	4			H5	
8	2,000	ST	51 BR333425	SCREW M 4 X12 UHJ GULCR	4			H6	
9	2,000	ST	52 BR321060	NUT M 4 M CU SN	4			H7	
10	2,000	ST	56 BR200417	SPACER Ø3 5X 7MM MEC	4			H8	
11	6,000	ST	31 BR368490	CONN D ACCESS. LOCK.HOOK	4			H9	
12	1,000	SÆ	31 BR368512	CONN D ACCESS. LATCH	4			H10	
13	1,000	ST	65 BR447870	HF-FILTER 25POLE CF6...	1			J	
14	1,000	ST	41 BR378690	REAR PLATE CF6150	1			MP1	
**********				********** NEXT ASSY **********					**********
	1,000	ST	BR444073	PANEL CF6150-01 EMK	1				

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TITLE: REAR PLATE ASSY CF6150

DOCUMENT NO.: 41 - BR378763 (378763)

REV: A

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR378801	PWB,METER SW 2 CF6150	3				
2	20,000	ST	31 BR369276	CONN TAB F/PWB	4			H1	A1
3	1,000	ST	33 BR378836	PUSH BTN SW TYPE MX-4B	3			S7-	
**********			**********	**** BILL OF DOCUMENTATION	**	**********	**********	**********	******
			BR4448 EC	FRONTPLATE CF6150					
**********			**********	********** NEXT ASSY ********	**	**********	**********	**********	******
	1,000	ST	BR444073	PANEL CF6150-01 EMK	1				

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TITLE: M-SW 2 CF6150 D4448

DOCUMENT NO.: 60 - BR378852 (378852)

REV: A1

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60 BR376051	ATT+BLOW.CTL CF6150 D4434	1			A1	
2	1,000	ST	41 BR378763	REAR PLATE ASSY CF6150	1			A2	
3	1,000	ST	60 BR378844	M-SW 1 CF6150-6210 D4410-	1			A3	
4	1,000	ST	60 BR378852	M-SW 2 CF6150 D4448	1			A4	
5	1,000	ST	65 BR364878	FILTER BANK CF6150-621	1			A5	
6	1,000	ST	60 BR444081	COMB1-2-ANT.ATT CF6150-01	1			A6	
7	1,000	ST	60 BR478873	SWR COM.CF6150-6210 D4788	1			A7	
8	1,000	ST	41 BR389625	FAN ALARM CF6150-621	1			A8	
9	2,000	ST	51 BR275360	SCREW M 2 X 5 CHJ GULCR	4			H1	
10	51,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H2	
11	1,000	ST	51 BR275530	SCREW M 3 X10 CHJ GULCR	4			H3	A1
12	13,000	ST	51 BR275611	SCREW M 4 X 5 CHJ GULCR	4			H4	A1
13	13,000	ST	51 BR333395	SCREW M 4 X 6 UHJ GULCR	4			H5	
14	23,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H6	A1
15	17,000	ST	51 BR333417	SCREW M 4 X10 UHJ GULCR	4			H7	A1
16	4,000	ST	51 BR333522	SCREW M 5 X12 UHJ GULCR	4			H8	
17	6,000	ST	52 BR327506	NUT M 3 M CU SN	4			H9	A1
18	8,000	ST	53 BR245674	WASHER,NYLON Ø10MM	4			H10	
19	4,000	ST	56 BR210706	CLAMP NYLON	4			H11	A1
20	2,000	ST	56 BR210714	CLAMP NYLON	4			H12	
21	2,000	ST	31 BR368490	CONN D ACCESS. LOCK.HOOK	4			H13	
22	6,000	ST	45 BR371157	STRAP,CABLE L 92XB2,6	4			H14	
23	1,000	SE	45 BR373265	TELESCOP.SLIDE,PAIR 17 3/	4			H15	
24	1,000	ST	38 BR366730	METER MC 28 1MA 100	3			M1	
25	1,000	ST	38 BR377511	METER MC 28 1MA 100	3			M2	
26	1,000	ST	41 BR367478	CHASSIS CF6150-621	1			MP1	
27	1,000	ST	46 BR373885	BRACKET,BOTTOM CF6150-621	1			MP2	
28	1,000	ST	46 BR373893	BRACKET,BOTTOM CF6150-621	1			MP3	
29	1,000	ST	41 BR367583	MOUNT.PL,FRONT CF6150-621	1			MP4	
30	1,000	ST	46 BR375128	BRACKET F.15P CONN CF6150	1			MP5	
31	1,000	ST	41 BR377333	FRONT PLATE CF6150 ENG	1			MP6	
33	2,000	ST	41 BR264261	PLATE,LOCK 7 INCH	1			MP8	
34	4,000	ST	46 BR268682	GUIDE F/THUMBSCREW 260827	2			MP9	
35	4,000	ST	53 BR267015	WASHER,NYLON Ø12MM X15MM	3			MP10	
36	4,000	ST	51 BR260827	THUMBSCREW,KNURLED M6	3			MP11	
37	2,000	ST	43 BR216704	HANDLE F.7" 155MM	3			MP12	

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TITLE: PANEL CF6150-01 EMK

DOCUMENT NO.: 41 - BR444073 (444073)

REV: A1

SHEET NO.: 1 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
38	1,000	ST	41 BR367524	TOP PLATE CF6150-621	1			MP13	
39	1,000	ST	46 BR373869	BRACKET,TOP CF6150-621	1			MP14	
40	1,000	ST	46 BR373877	BRACKET,TOP CF6150-621	1			MP15	
41	1,000	ST	65 BR432288	FILTER,AIR ASSY P-P.CF PA	1			MP16	
42	1,000	ST	56 BR375144	SPACER F.TOP PLATE CF6150	1			MP17	
43	3,000	ST	52 BR269611	STAY NUT M3 X10 N7	3			MP18	A1
44	1,000	ST	46 BR373850	U-BAR F.FRONT PLATE CF615	1			MP19	
45	1,000	ST	37 BR378704	CABLE ASSY CF6150	1			W1	
46	1,000	ST	48 BR375837	LABEL HIGH VOLT.	3				A1
47	4,000	ST	51 BR333468	SCREW M 4 X16 UHJ GULCR	4				A1
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	**********
	1,000	ST	BR453668	TX.S76150 3F.	1				
	1,000	ST	BR453854	TX.S76150 1F.	1				

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TITLE: PANEL CF6150-01 EMK

DOCUMENT NO.: 41 - BR444073 (444073)

REV: A1

SHEET NO.: 2 OF 2

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60 BR364827	ANT.ATTENUAT.CF6... D4408	1			A1	
2	1,000	ST	60 BR378739	OUTPCOM 500W CF6150 D4439	1			A2	
3	1,000	ST	61 BR364886	POWER REGL. CF6... D4405	1			A3	
4	20,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H1	
5	3,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H2	
6	2,000	ST	51 BR333271	SCREW M 3 X10 UHJ GULCR	4			H3	
7	4,000	ST	51 BR275549	SCREW M 3 X12 CHJ GULCR	4			H4	
8	2,000	ST	52 BR327506	NUT M 3 M CU SN	4			H5	
9	4,000	ST	56 BR200425	SPACER Ø3 5X 8MM MEC	4			H6	
10	1,000	ST	75 BR217832	RUBBER SLV 8X10X14X8	4			H7	
11	2,000	ST	31 BR368210	COAX CONN BNC FEM-CHASS.	4			J4,J5	
12	1,000	ST	41 BR367540	CHASSIS COMB.UNIT CF6150	1			MP1	
13	1,000	ST	46 BR367516	BRACKET F.CONN CF6150-621	1			MP2	
14	1,000	ST	46 BR367559	BRACKET COMB.UNIT CF6150	1			MP3	
15	1,000	ST	46 BR367567	BRACKET F.SWR COMP.CF6150	1			MP4	
16	1,000	ST	37 BR369047	COAX CA ASSY CF6150-621	3			W1	
17	1,000	ST	37 BR452459	CABLE ASSY CF6150-01	1			W2	
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	**********
	1,000	ST	BR444073	PANEL CF6150-01 EMK	1				

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TITLE: COMB1-2-ANT.ATT CF6150-01

DOCUMENT NO.: 60 - BR444081 (444081)

REV: A

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR478857	PWB,SWR COMPUTER CF6150-6	3				
2	2,000	ST	22 BR363340	CAP. CER. 1N2 100 K HI-K	4			C1,C4	
3	3,000	ST	22 BR450359	CAP. ELEC 1U 25 M	4			C2,C6,C19	
4	3,000	ST	22 BR357642	CAP. CER. 10N 100 S HI-K	4			C7,C9,C11	
5	1,000	ST	22 BR451339	CAP. ELEC 15U 10 M	4			C8	
6	1,000	ST	22 BR209570	CAP. PLST 47N 250 K	4			C10	
7	1,000	ST	22 BR369470	CAP. PLST 4N7 160 F	4			C12	
8	2,000	ST	22 BR344273	CAP. PLST 22N 250 K	4			C13,C14	
9	8,000	ST	22 BR209554	CAP. PLST 10N 250 K	4			C15,C29,C31,C33,C35,C37, C39,C41	
10	1,000	ST	22 BR203572	CAP. ELEC 22U 64 T LL	4			C16	
11	3,000	ST	22 BR202967	CAP. PLST 100N 100 K	4			C17,C23,C26	
12	2,000	ST	22 BR209503	CAP. PLST 470N 100 K	4			C21,C25	
13	1,000	ST	22 BR458708	CAP. ELEC 2U2 25 M	4			C22	
14	4,000	ST	22 BR479330	CAP. ELEC 4U7 25 M	4			C42,C43,C44,C45	
15	4,000	ST	23 BR363758	DIO SCHOT MBD701 HOT CARR	4			CR1,CR2,CR3,CR4	
16	11,000	ST	23 BR228087	DIO SIGN. 1N4148 SI 150MA	4			CR5,CR6,CR7,CR8,CR9,CR10, CR11,CR12,CR13,CR14,CR15	
17	23,000	ST	31 BR261270	TERMINAL STUD	4			TP1-2	A1
18	2,000	ST	26 BR274097	TRANS.LOPOW BC 547C SI-N	4			Q1,Q2	
19	1,000	ST	26 BR357901	TRANS.JFETN J 310 TO-92	4			Q3	
20	2,000	ST	26 BR359157	TRANS.LOPOW BC 251 SI-P T	4			Q4,Q5	
21	4,000	ST	26 BR355704	TRANS.DARLN BD 679 SI-N T	4			Q6,Q7,Q8,Q9	
22	2,000	ST	21 BR241202	RES CARB. 100R 1/2JSFR25H	4			R1,R2	
23	11,000	ST	21 BR240745	RES CARB. 100K 1/4J SFR25	4			R3,R4,R8,R9,R18,R54,R55, R58,R59,R62,R63	
24	2,000	ST	21 BR240648	RES CARB. 27K 1/4J SFR25	4			R5,R10	
25	2,000	ST	21 BR242349	RES FILM 100R 1.6J PR37	4			R6,R7	
26	8,000	ST	21 BR240567	RES CARB. 10K 1/4J SFR25	4			R11,R26,R76,R77,R78,R79, R80,R81	
27	2,000	ST	21 BR240699	RES CARB. 51K 1/4J SFR25	4			R12,R14	
28	5,000	ST	21 BR240400	RES CARB. 1KO 1/4J SFR25	4			R13,R34,R37,R39,R40	
29	1,000	ST	21 BR391980	RES SEMIV 2K 1/2K CERM	4			R15	
30	6,000	ST	21 BR240613	RES CARB. 18K 1/4J SFR25	4			R16,R27,R90,R91,R92,R93	
31	2,000	ST	21 BR240664	RES CARB. 39K 1/4J SFR25	4			R17,R23	
32	3,000	ST	21 BR240702	RES CARB. 56K 1/4J SFR25	4			R19,R20,R30	

Dansk Radio AS
DK-2630 Taastrup,
Denmark
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TITLE: SWR COMP.ASSY CF6.. D4788

DOCUMENT NO.: 60 - BR478865 (478865)

REV: A1

SHEET NO.: 1 OF 3

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
33	5,000	ST	21 BR240729	RES CARB. 75K 1/4J SFR25	4			R21, R86, R87, R88, R89	
34	1,000	ST	21 BR240680	RES CARB. 47K 1/4J SFR25	4			R22	
35	1,000	ST	21 BR240605	RES CARB. 15K 1/4J SFR25	4			R24	
36	1,000	ST	21 BR363227	RES SEMIV 10K 1/2K CERM	4			R25	
37	6,000	ST	21 BR240427	RES CARB. 1K5 1/4J SFR25	4			R28, R46, R82, R83, R84, R85	
38	1,000	ST	21 BR357693	RES CARB. 150K 1/4J SFR25	4			R29	
39	5,000	ST	21 BR240540	RES CARB. 6K8 1/4J SFR25	4			R31, R33, R64, R70, R72	
40	5,000	ST	21 BR240516	RES CARB. 4K7 1/4J SFR25	4			R32, R44, R45, R51, R95	
41	2,000	ST	21 BR240656	RES CARB. 33K 1/4J SFR25	4			R35, R36	
42	1,000	ST	21 BR240621	RES CARB. 22K 1/4J SFR25	4			R38	
43	1,000	ST	21 BR240168	RES CARB. 33R 1/4J SFR25	4			R41	
44	1,000	ST	21 BR363235	RES SEMIV 5K 1/2K CERM	4			R42	
45	1,000	ST	21 BR240524	RES CARB. 5K6 1/4J SFR25	4			R43	
46	7,000	ST	21 BR240478	RES CARB. 2K7 1/4J SFR25	4			R15, R47, R67, R69, R71, R73, R75	A1
47	1,000	ST	21 BR240389	RES CARB. 680R 1/4J SFR25	4			R48	
48	1,000	ST	21 BR240311	RES CARB. 330R 1/4J SFR25	4			R49	
49	2,000	ST	21 BR240451	RES CARB. 2K2 1/4J SFR25	4			R50, R96	
50	6,000	ST	21 BR240737	RES CARB. 82K 1/4J SFR25	4			R52, R53, R56, R57, R60, R61	
51	3,000	ST	21 BR240486	RES CARB. 3K3 1/4J SFR25	4			R66, R68, R74	
52	1,000	ST	21 BR240494	RES CARB. 3K9 1/4J SFR25	4			R94	
53	1,000	ST	21 BR240222	RES CARB. 100R 1/4J SFR25	4			R97	
54	8,000	ST	24 BR357707	IC LIN MC 1458P OP.AMPL.	4			U1, U2, U6, U7, U8, U10, U12, U13	
55	2,000	ST	24 BR363014	IC DGTL 4001B 4X2 IN NOR	4			U3, U9	
56	1,000	ST	24 BR355054	IC DGTL 4081B 4X2 IN AND	4			U4	
57	1,000	ST	24 BR367672	IC DGTL 4093B 4X2IN NAND	4			U5	
58	1,000	ST	24 BR367753	IC LIN LM 311N VOLT COMP.	4			U11	
59	1,000	ST	24 BR227412	IC DGTL 74 10N 3X3IN NAND	4			U14	
60	1,000	ST	24 BR363243	IC DGTL 74121N MONOSTAB.	4			U15	
**********	**********	**	**********	********** BILL OF DOCUMENTATION	**	**********	**********	**********	**********
			BR478865 EC	SWR COMP.ASSY CF6					
			BR478865 PD	SWR COMP.ASSY CF6.. D4788					
			BRQA4622 TP	SWR COMPAR.S76210/S76150					

Dansk Radio AS
DK-2630 Taastrup,
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TITLE: SWR COMP.ASSY CF6.. D4788

DOCUMENT NO.: 60 - BR478865 (478865)

REV: A1

SHEET NO.: 2 OF 3

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	******
	1,000	ST	BR478873	SWR COM.CF6150-6210 D4788	1				

Dansk Radio AS
DK-2630 Taastrup,
Denmark
Telex 33358 darios dk.
Telefax +45 42 52 23 80

TITLE: SWR COMP.ASSY CF6.. D4788

DOCUMENT NO.: 60 - BR478865 (478865)

REV: A1

SHEET NO.: 3 OF 3

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	60 BR478865	SWR COMP.ASSY CF6.. D4788	1			A1	
2	1,000	ST	60 BR379107	CAP. ASSY CF6150-621	1			A2	
3	4,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H1	
4	4,000	ST	52 BR327506	NUT M 3 M CU SN	4			H2	
5	0,650	M	32 BR220094	FLEX SILICONE 1/1,8 TRAN	4			H3	
6	3,000	ST	31 BR231096	TERMINAL LUG 3,25MM 1F	4			H4	
7	1,000	ST	31 BR226904	CONN D SOLDER 25P FEMALE	4			J1	
8	1,000	ST	41 BR379417	CASSETTE SWR COMP CF....	1			MP1	
9	1,000	ST	41 BR213500	COVER F.CASSETTE MINIRACK	1			MP2	
10	1,000	ST	46 BR365882	BRACKET F.25P CONN.CF6150	1			MP3	
11	1,000	ST	37 BR387592	CABLE ASSY SWR CF6150-621	1			W1	
12	0,180	M	32 BR223115	COAX CABLE 50R TEFLON	4			W2	
13	2,000	ST	46 BR268674	GUIDE F/THUMBSCREW 260819	3				A1
14	8,000	ST	54 BR245607	RIVET,TUBULAR 2,5/4,3	4				A1
15	1,000	ST	41 BR379492	FRONTPL M1 SWR CF6150-621	1				A1
**********				********** BILL OF DOCUMENTATION				**********	
			BR478865 PD	SWR COMP.ASSY CF6.. D4788					
**********				********** NEXT ASSY **********				**********	
	1,000	ST	BR444030	PANEL CF6210-01 COMB.& FL	1				
	1,000	ST	BR444073	PANEL CF6150-01 EMK	1				

Dansk Radio AS

DK-2630 Taastrup,
Denmark
Telex 33358 darios dk.
Telefax +45 42 52 23 80

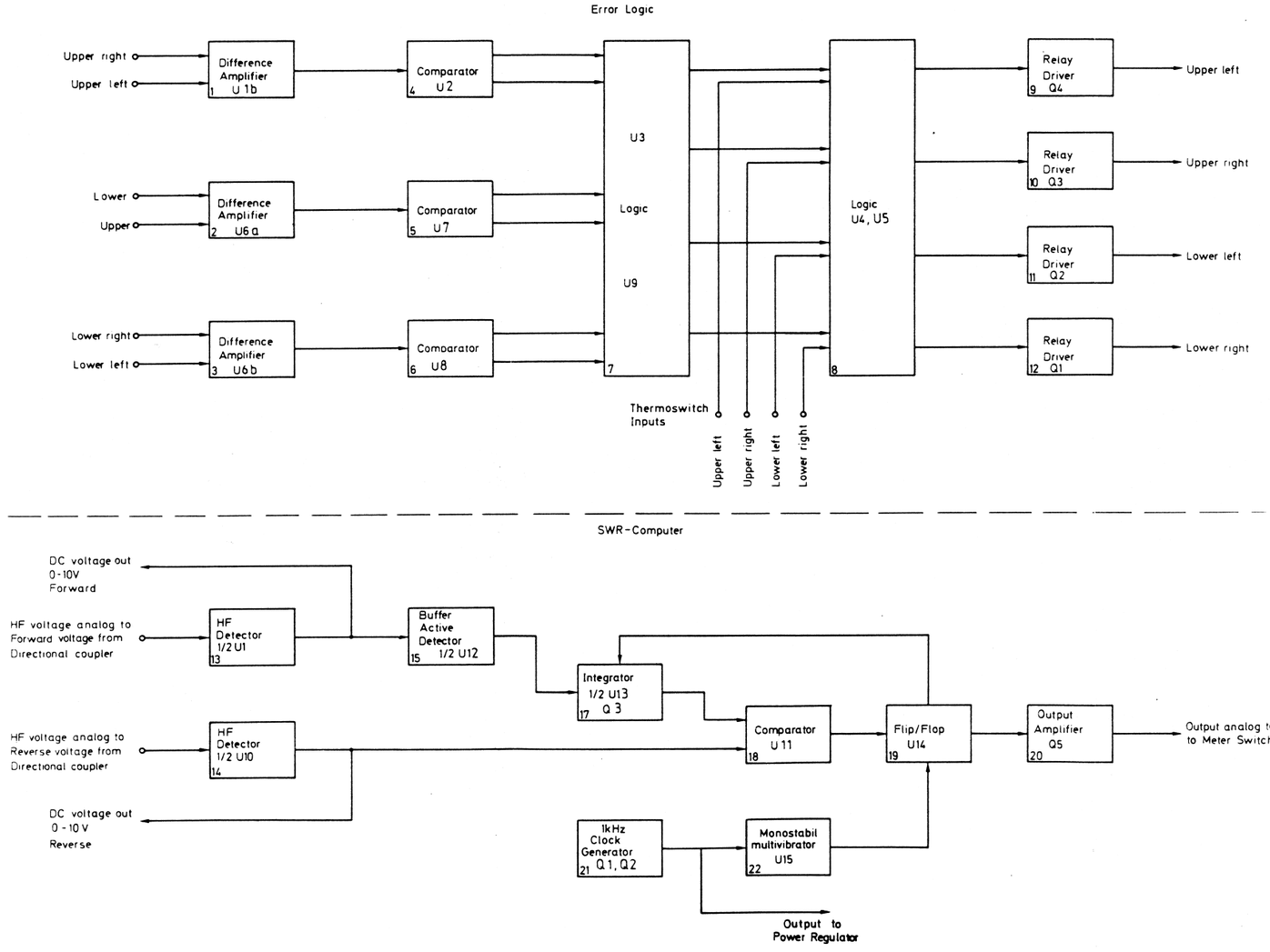
TITLE: SWR COM.CF6150-6210 D4788

DOCUMENT NO.: 60 - BR478873 (478873)

REV: A1

SHEET NO.: 1 OF 1

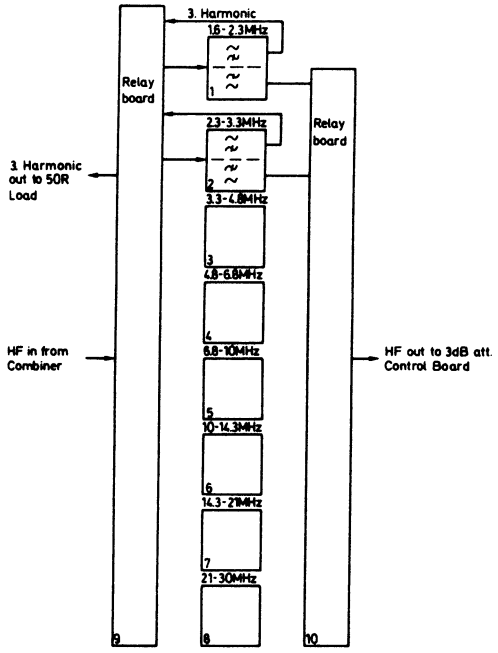
A4 Form 200473 FB Rev A



CF 6150 / CF 6210 DIAG. No. 4446A / 1985-02

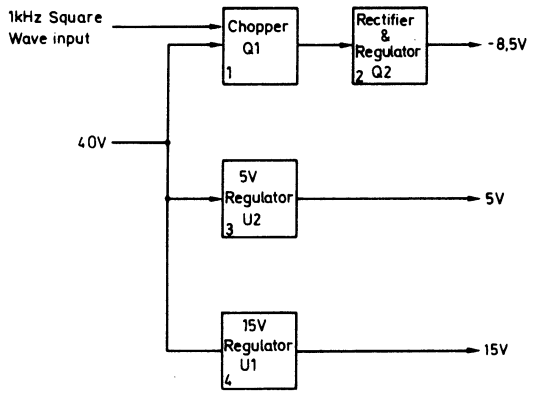
BLOCK DIAGRAM SWR-COMPUTER

(Ref. Desig. 4446A)



Block Diagram Filter Bank

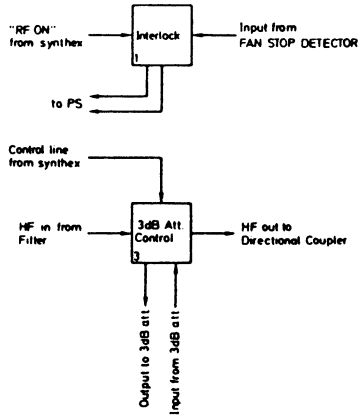
Ref. Designation 4452



Block Diagram Power Regulator

CF6150/CF6210 DIAG No. 4453

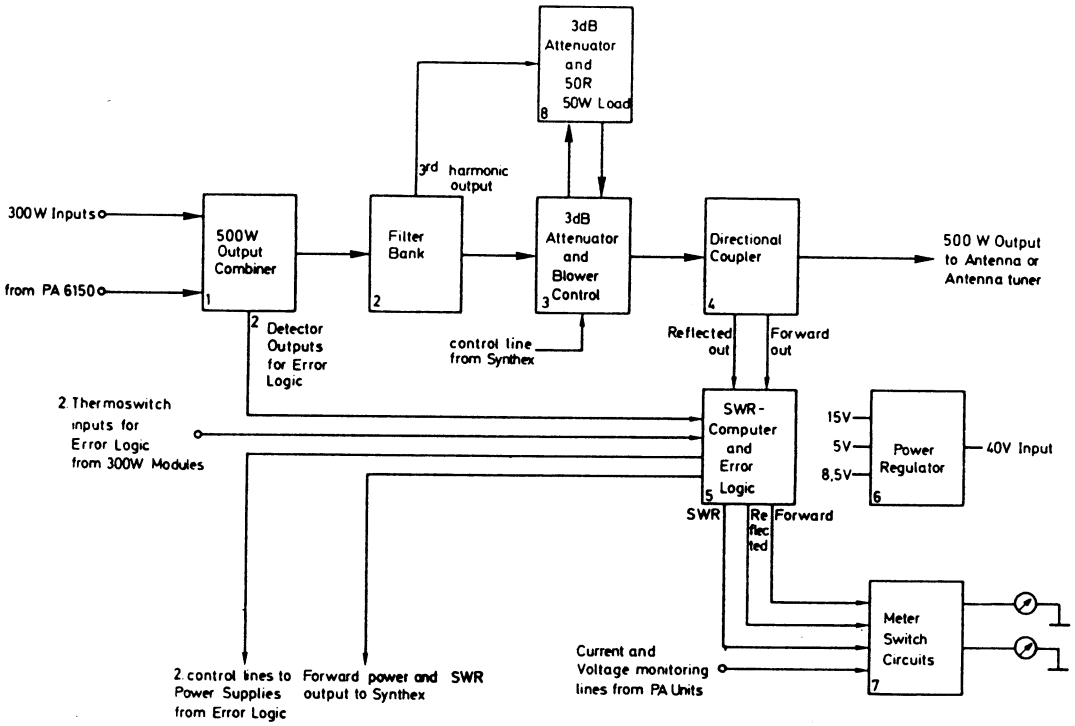
Ref. Designation 4453



Block Diagram 3-dB Attenuator and Blower Control

CF6150 DIAG No. 4468

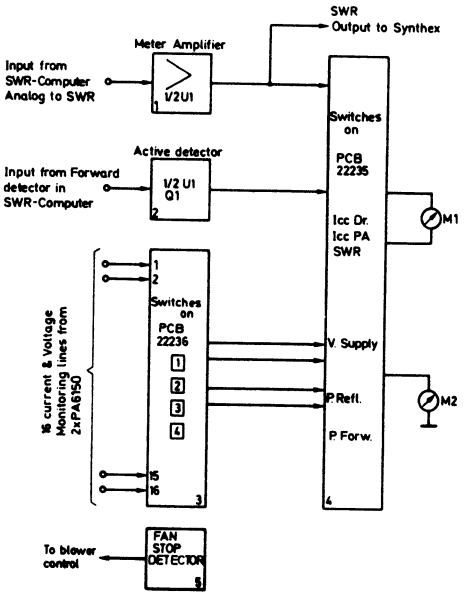
Ref. Designation 4468



Block Diagram Combination and Filter Panel

CF6150 DIAG No. 4469

Ref. Designation 4469



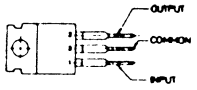
Block Diagram Front Panel

CF 6150 DIAG No. 4470

Ref. Designation 4470

μA 7815 UC

TO-220 PACKAGE (TOP VIEW)

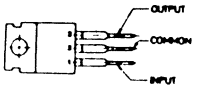


OUTPUT VOLTAGE	PART NO.
5V	μA7805UC
15V	μA7815UC

U 1

μA 7805 UC

TO-220 PACKAGE (TOP VIEW)



OUTPUT VOLTAGE	PART NO.
5V	μA7805UC
15V	μA7815UC

U 2

Note 1:

Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

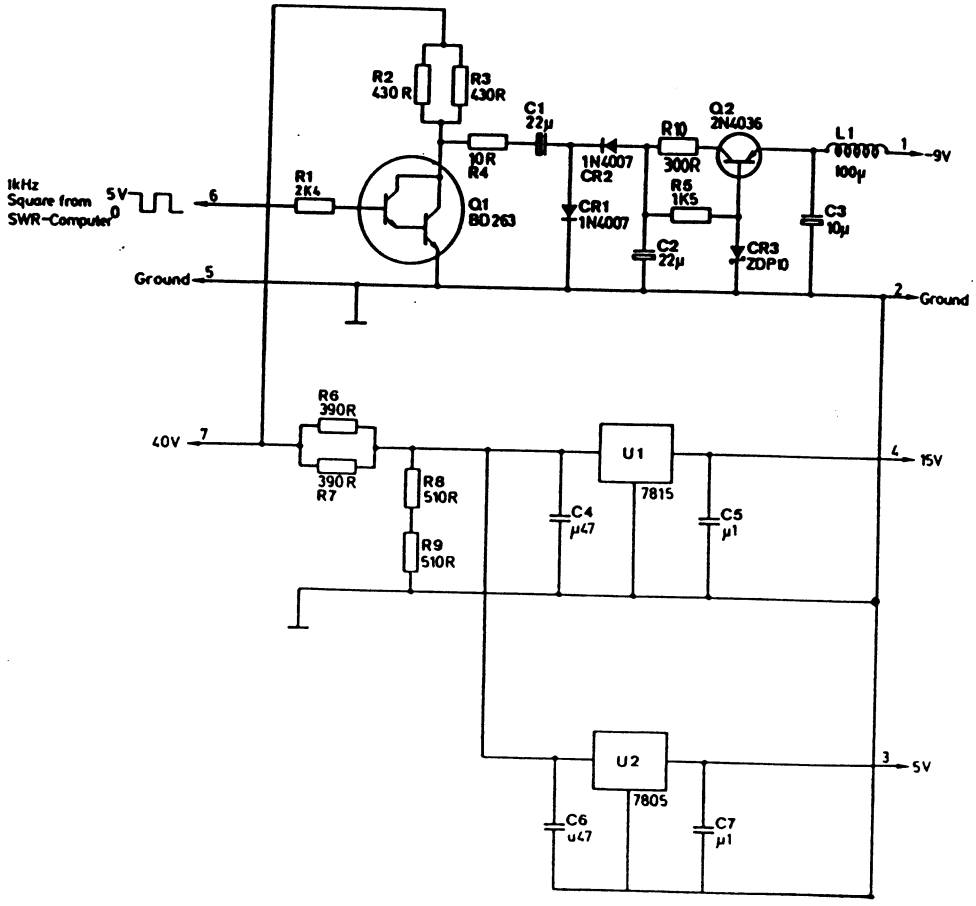
Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and μ, (pF, nF, and μF).

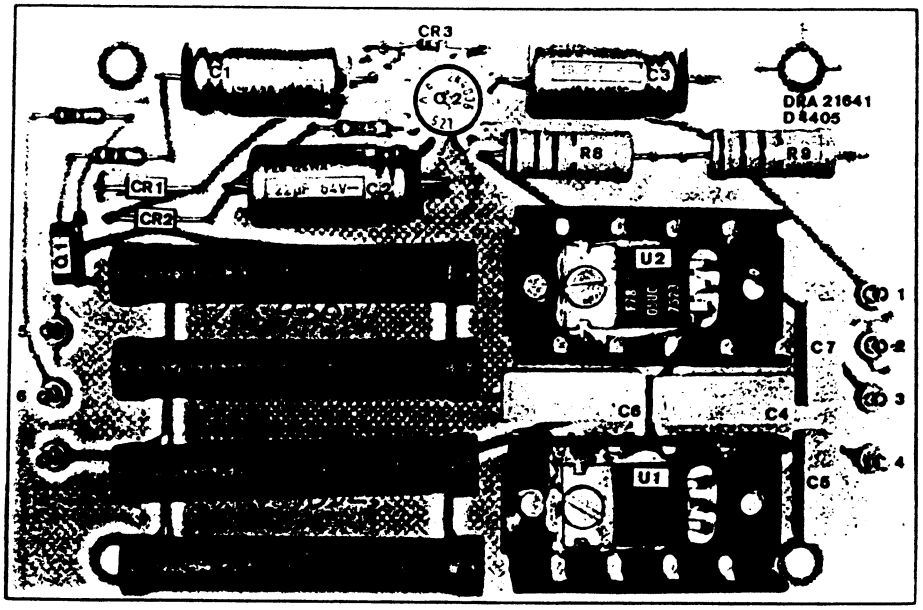
The inductance units are indicated by means of the international prefixes μ, and m, (μH, and mH).

P. C. Board 21641



Power Regulator

Ref. Designation 4405



Power Regulator
Ref. Desig. 4405
Component Location

Note 1:

Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

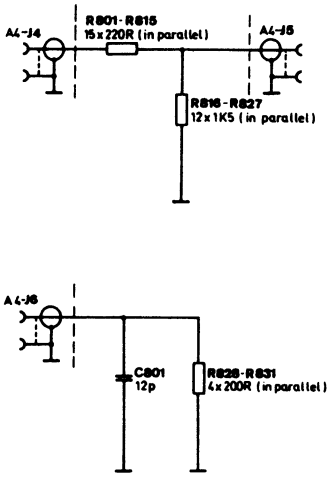
Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and μ, (pF, nF, and μF).

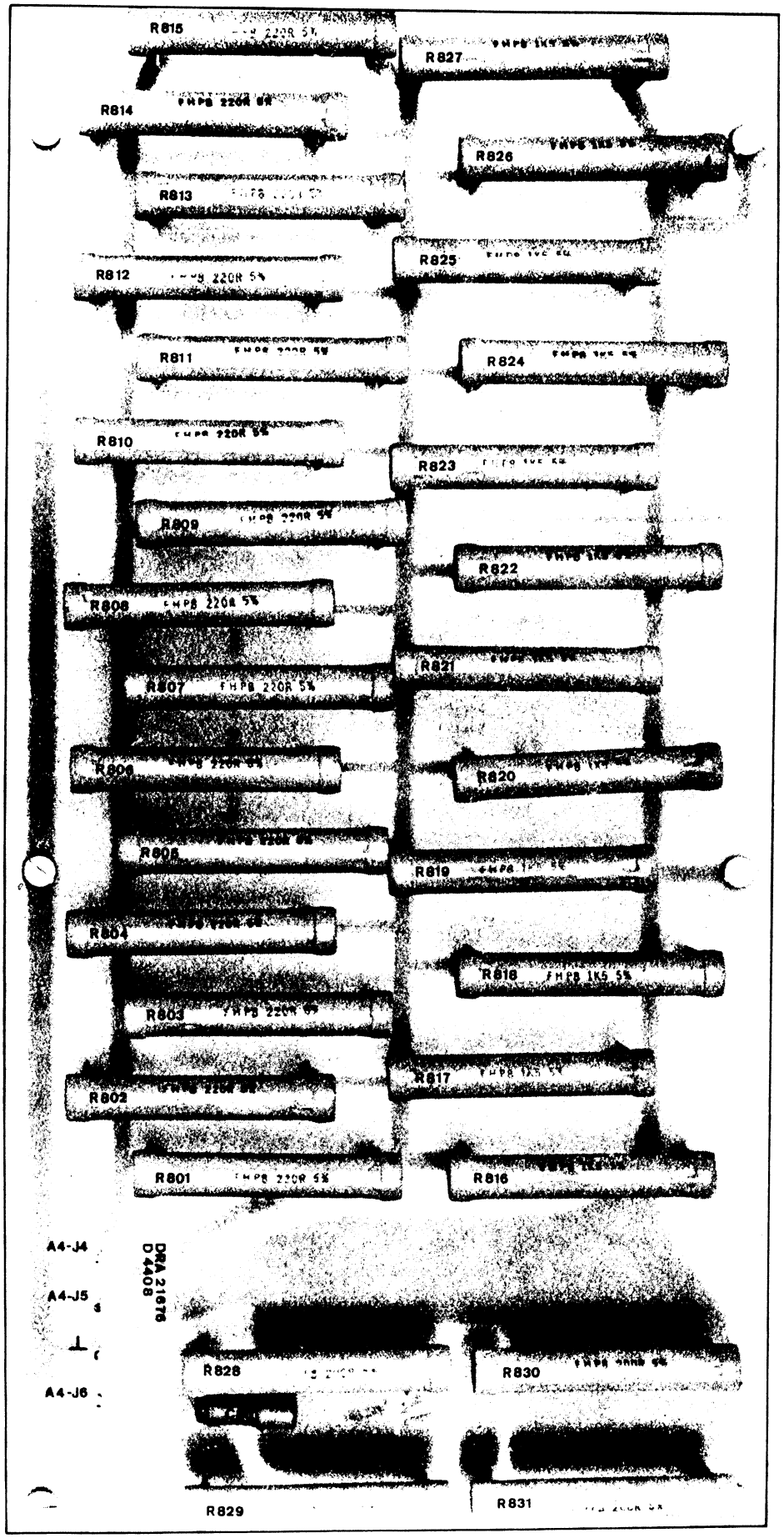
The inductance units are indicated by means of the international prefixes μ, and m, (μH, and mH).

P. C. Board 21676



3-dB Attenuator and 50 ohm/ 50-W Load

Ref. Designation 4408

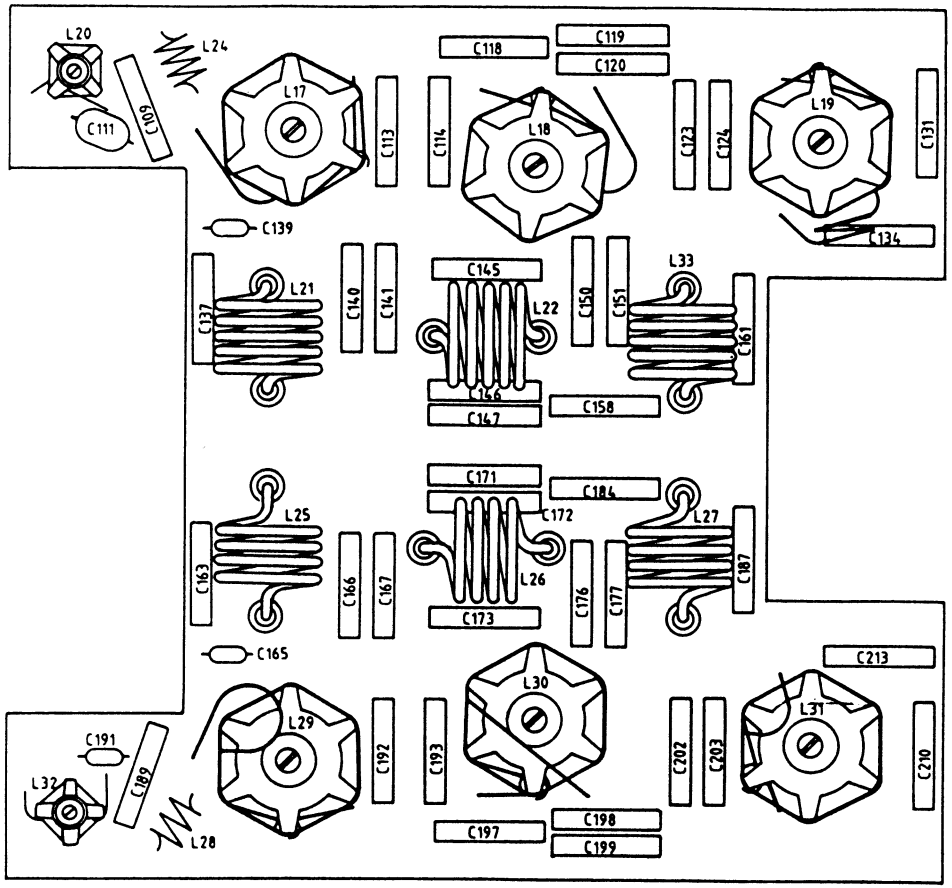


3-dB Attenuator and 50-Ω/50-W Load.

Ref. Desig. 4408.

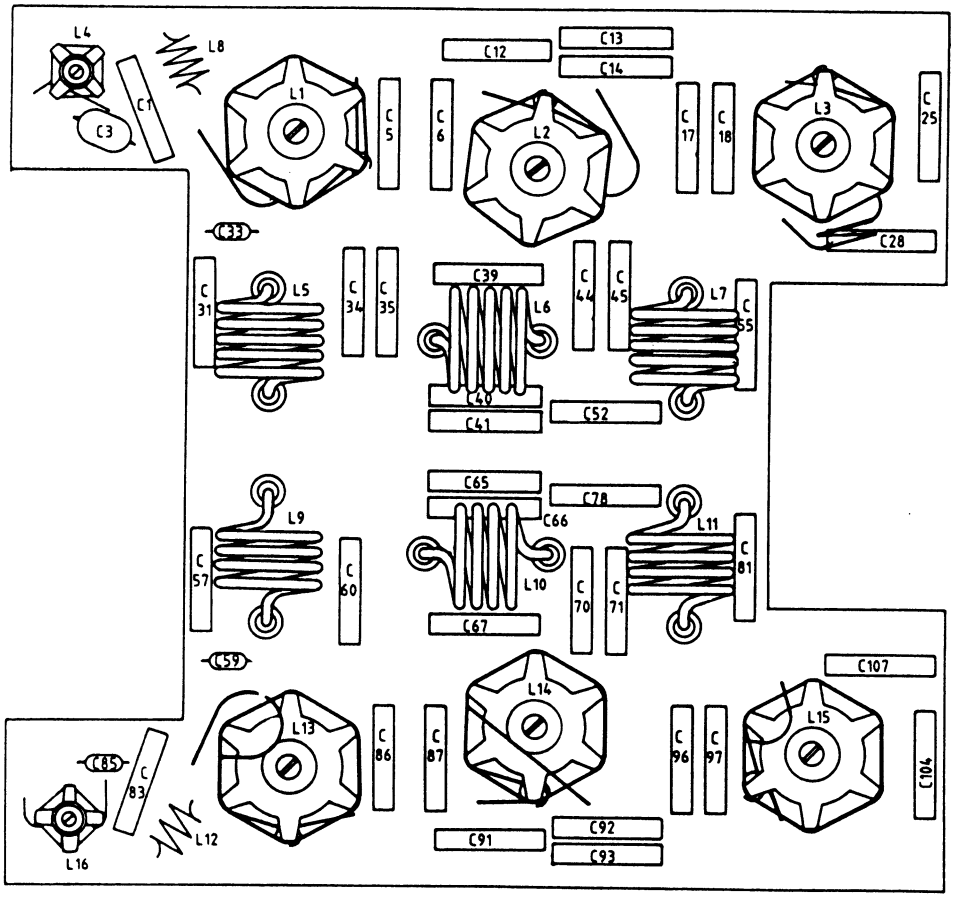
Component Location.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A	OPRETTET IFLG ÆO4564	15 2 90	VH

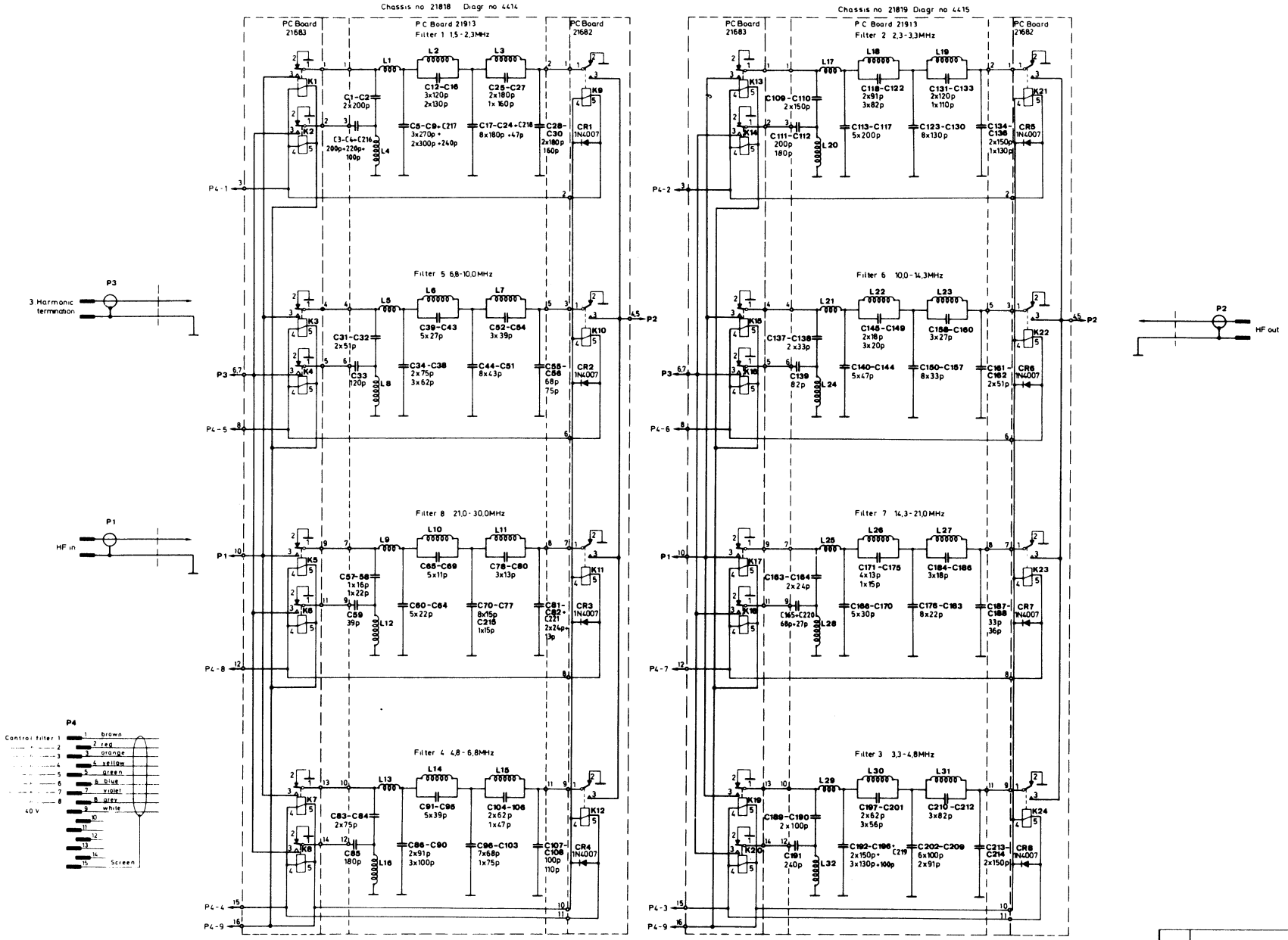


		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075	VR NR 366587 PWB NR. 21913	**Dansk Radio AS**	dra
		ANGLES	DR VH 15 2 90	TITLE COMPONENT LOCATION FILTER BANK	
		LIN. DIM.	CH		
			AP SN 6-2 90		
			AP		
	CF6210	MATERIAL	FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO. 4415	
NEXT ASSY	USED ON			SCALE 1:1	SHEET 1 OF 1
APPLICATION					

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVAL
	A	OPRETTET IFLG ÆO 4564	15 2 90	VH



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES AND TOLERANCES ARE IN ACCORDANCE WITH DS 2075	VR NR 366579 PWB NR 21913	Dansk Radio AS
		ANGLES	DR VH 15 2 90	TITLE COMPONENT LOCATION FILTER BANK
		LIN DIM	CH	
			AP SN 16-2-90	
	CF6210	MATERIAL	AP	
NEXT ASSY	USED ON		FIRST ANGLE PROJECTION	SIZE A2 / CODE IDENT / DRAWING NO 4414
APPLICATION			SCALE 1:1	SHEET 1 OF 1


Chassis no 21818 Diagr no 4414
PC Board 21683
PC Board 21913
Filter 1 1,5 - 2,3MHz
PC Board 21682
L1
L2
L3
K1
K2
K9
C1-C2 2x200p
C3-C4-C216 200p+220p+100p
C5-C9+C217 3x270p+2x300p+240p
C12-C16 3x120p 2x130p
C17-C24+C218 8x180p+47p
C25-C27 2x180p 1x160p
C28-C30 2x180p 160p
CR1 1N4007
L4
P4-1
P4-2
Chassis no 21819 Diagr no 4415
PC Board 21683
PC Board 21913
Filter 2 2,3 - 3,3MHz
PC Board 21682
L17
L18
L19
K13
K14
K21
C109-C110 2x150p
C111-C112 200p 180p
C113-C117 5x200p
C118-C122 2x91p 3x82p
C123-C130 8x130p
C131-C133 2x120p 1x110p
C134-C136 2x150p 1x130p
CR5 1N4007
L20
P4-2
P4-3
P3
3 Harmonic termination
Filter 5 6,8-10,0MHz
L5
L6
L7
K3
K4
K10
C31-C32 2x51p
C33 120p
C34-C38 2x75p 3x62p
C39-C43 5x27p
C44-C51 8x43p
C52-C54 3x39p
C55-C56 68p 75p
CR2 1N4007
L8
P3
P4-5
P4-6
P2
Filter 6 10,0 - 14,3MHz
L21
L22
L23
K15
K16
K22
C137-C138 2x33p
C139 82p
C140-C144 5x47p
C145-C149 2x18p 3x20p
C150-C157 8x33p
C158-C160 3x27p
C161-C162 2x51p
CR6 1N4007
L24
P3
P4-6
P4-5
P2
P1
HF in
Filter 8 21,0 - 30,0MHz
L9
L10
L11
K5
K6
K11
C57-58 1x16p 1x22p
C59 39p
C60-C64 5x22p
C65-C69 5x11p
C70-C77 8x15p
C78-C80 3x13p
C81-C82+C221 2x24p+13p
CR3 1N4007
L12
P1
P4-8
P4-7
Filter 7 14,3 - 21,0MHz
L25
L26
L27
K17
K18
K23
C163-C164 2x24p
C165+C220 68p+27p
C166-C170 5x30p
C171-C175 4x13p 1x15p
C176-C183 8x22p
C184-C186 3x18p
C187-C188 33p 36p
CR7 1N4007
L28
P1
P4-7
P4-8
P2
HF out
Filter 4 4,8 - 6,8MHz
L13
L14
L15
K7
K8
K12
C83-C84 2x75p
C85 180p
C86-C90 2x91p 3x100p
C91-C95 5x39p
C96-C103 7x68p 1x75p
C104-106 2x62p 1x47p
C107-C108 100p 110p
CR4 1N4007
L16
P4-4
P4-9
P4-3
P4-9
Filter 3 3,3 - 4,8MHz
L29
L30
L31
K19
K20
K24
C189-C190 2x100p
C191 240p
C192-C196+C219 2x150p+3x130p+100p
C197-C201 2x62p 3x56p
C202-C209 6x100p 2x91p
C210-C212 3x82p
C213-C214 2x150p
CR8 1N4007
L32
P4
Control filter 1
1 brown
2 red
3 orange
4 yellow
5 green
6 blue
7 violet
8 grey
9 white
10
11
12
13
14
15 Screen
40 V
Ref Desig
Description
Specification
Qty
(kg, m)
DRA code
Tools
Coating
Dimensions without tolerance indication
dansk radio aktieselskab
Scale
Drawn
Check
Appr
Filter bank
CF 6210
DRA code
Superseded
4414/4415-B
Superseded by

Note 1:

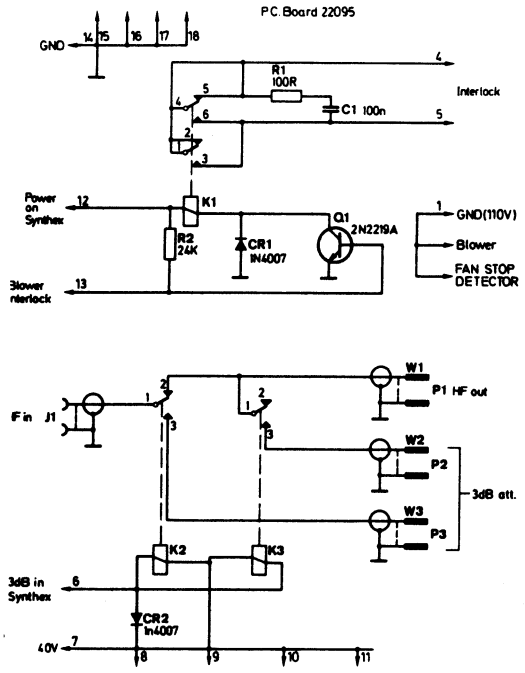
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and μ, (pF, nF, and μF).

The inductance units are indicated by means of the international prefixes μ, and m, (μH, and mH).



3-dB Attenuator and Blower Control

CF6150 DIAG No. 4434

Ref. Designation 4434

3-dB Attenuator
and Blower Control
Ref. Desig. 4434
Component Location

Note 1:

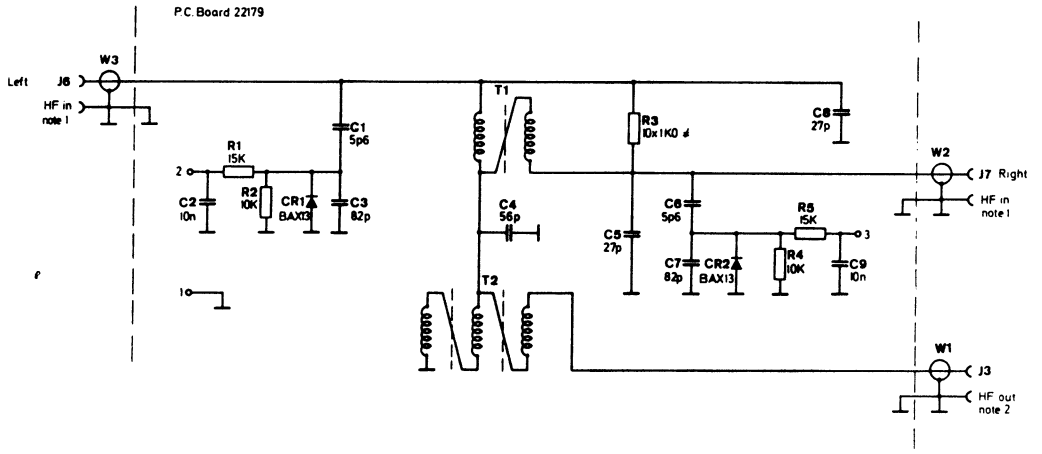
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and µ, (pF, nF, and µF).

The inductance units are indicated by means of the international prefixes µ, and m, (µH, and mH).

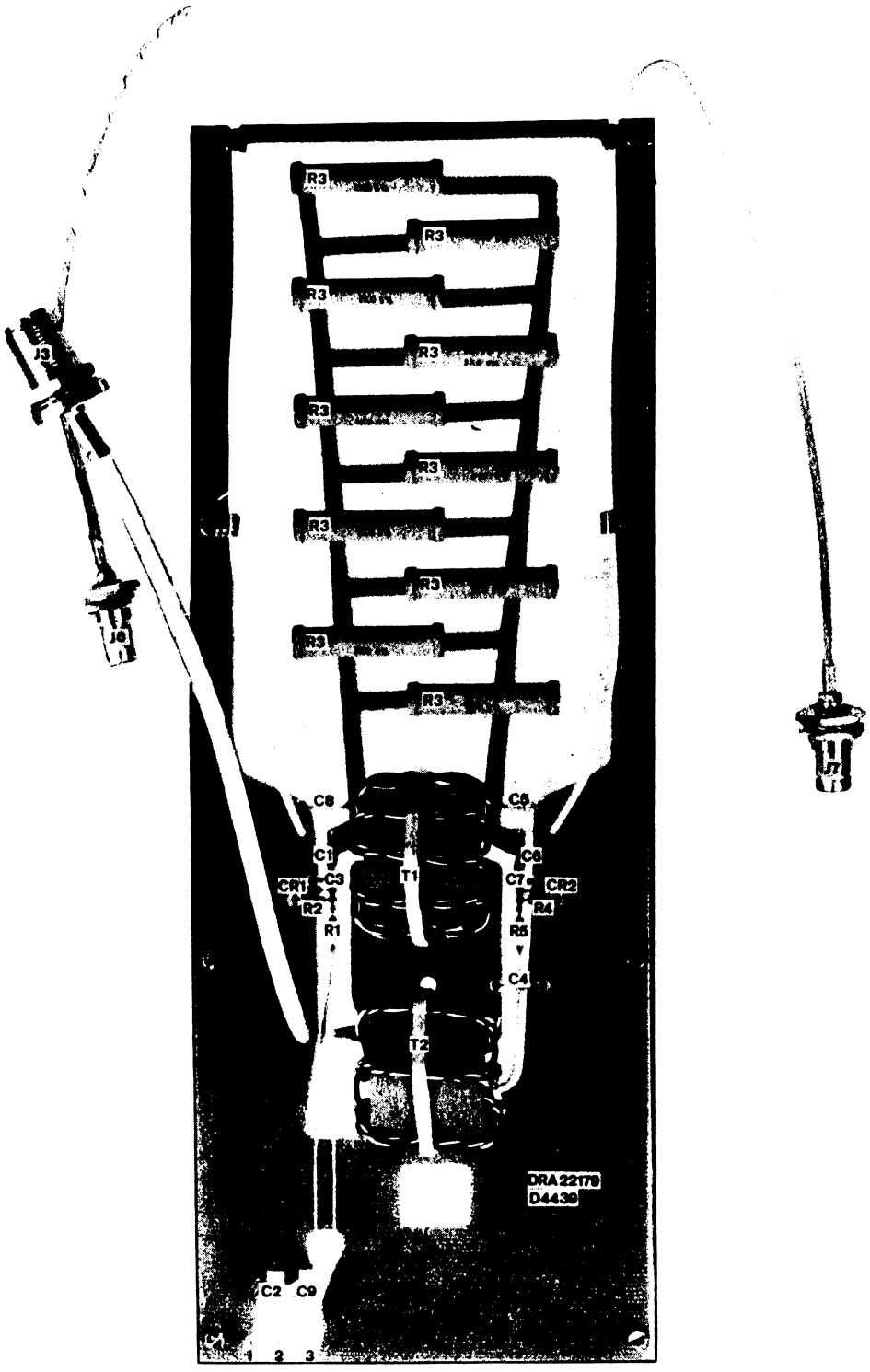


note 1 J6, J7 are mounted on the rear of CF 6150
note 2 J3 is mounted on the Combiner Channel

500-W Output Combiner

CF6150 DIAG No. 4439

Ref. Designation 4439



500-W Output Combiner
Ref. Desig. 4439
Component Location

Note 1:

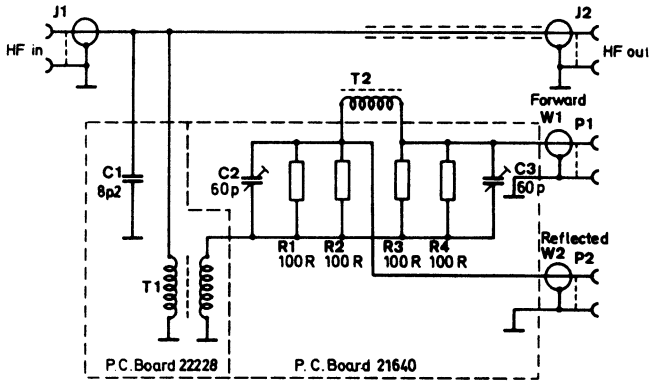
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance value responds to that specified in IEC 62, with the excep that decimal fractions are used for values below 1Ω, 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

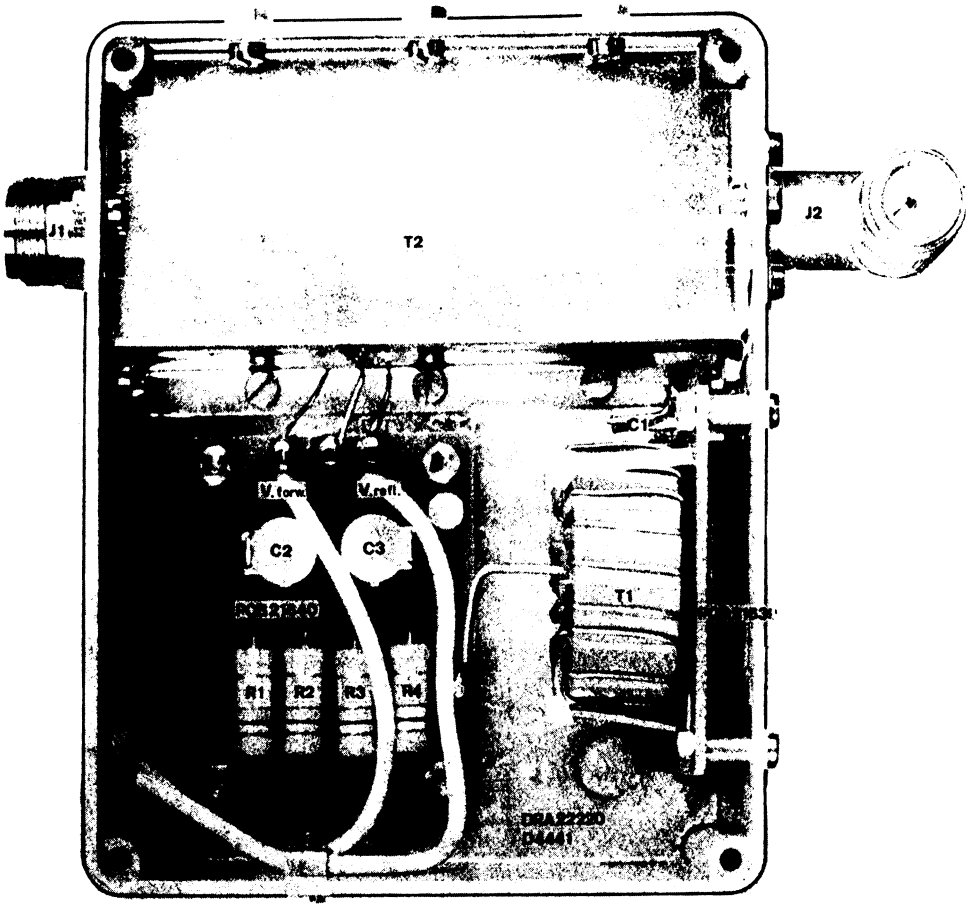
The capacitance units are indicated by means of the ternational prefixes p, n, and µ, (pF, nF, and µF).

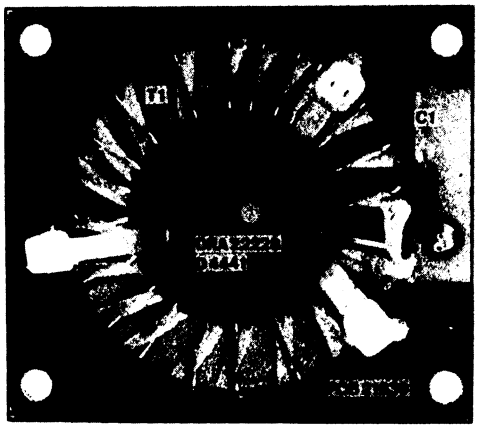
The inductance units are indicated by means of the ir national prefixes µ, and m, (µH, and mH).



27-dB Directional Coupler

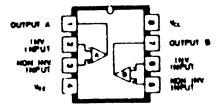
Ref. Designation 4441





27-dB Directional Coupler
Ref. Desig. 4441
Component Location

MC 14558



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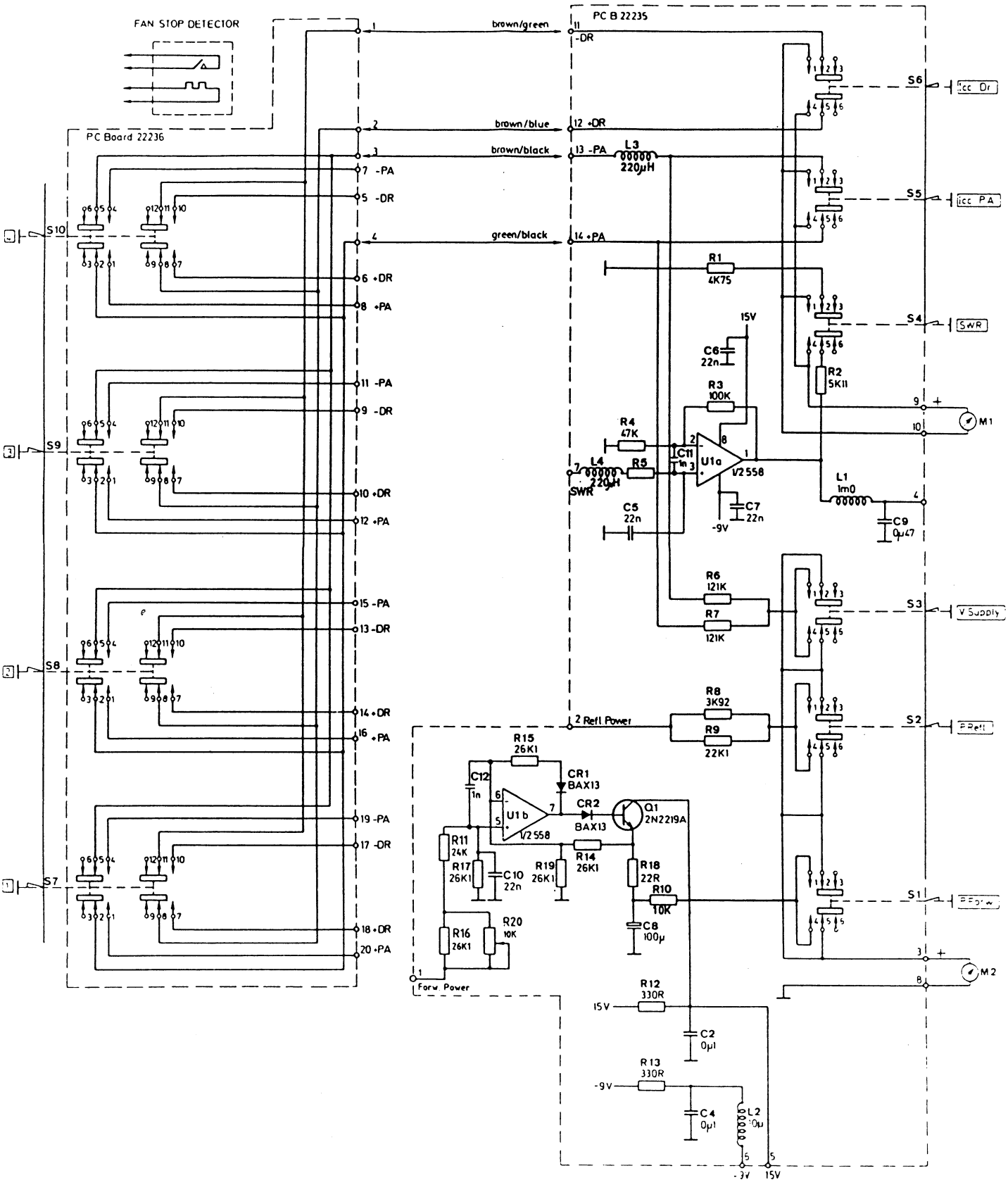
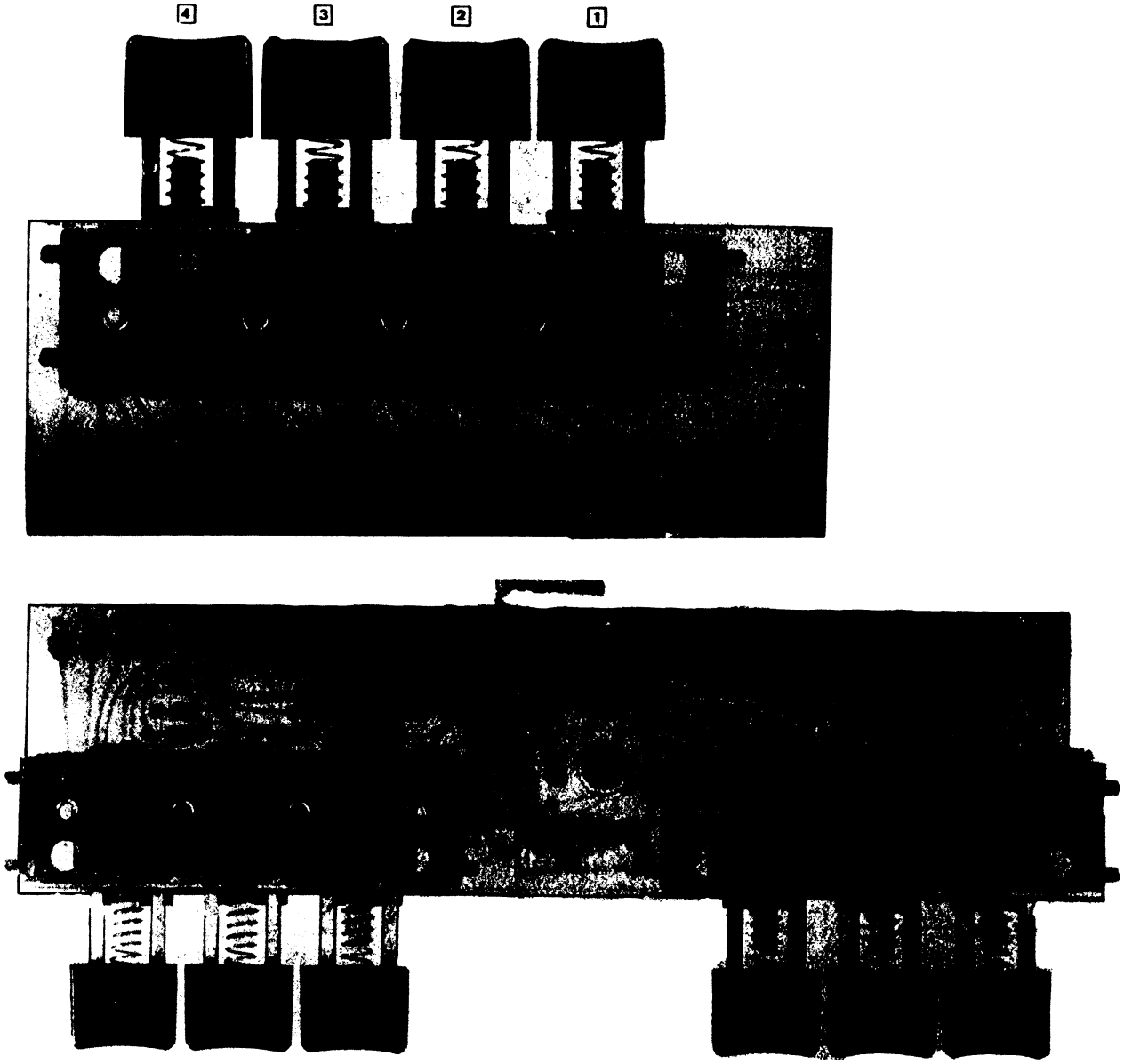


Front Panel

CF6150 DIAG No. 4448 / 1987-09

Ref. Designation 4448



Front Panel Circuits.
Ref. Desig. 4448.
Component Location.

Note 1:

Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

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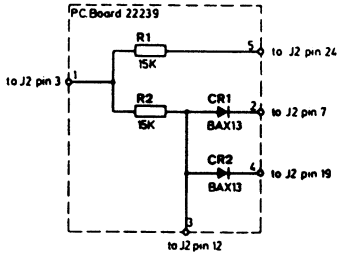
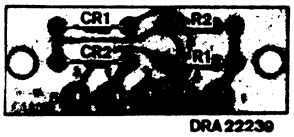


CF6150 DIAG No. 4451

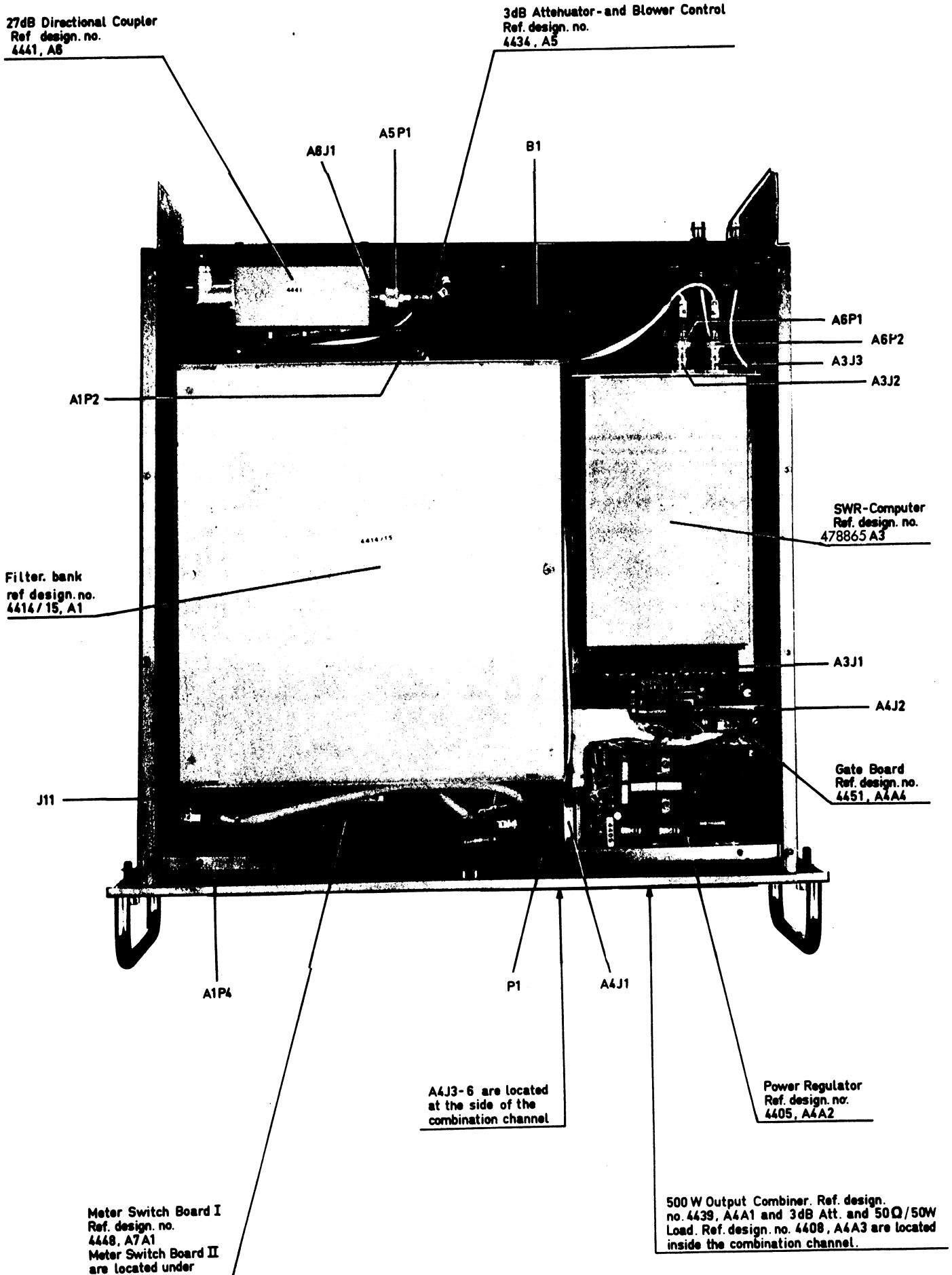
Gate Board

Ref. Designation 4451

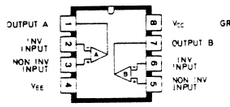


DRA 22239
D4451

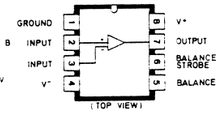
Gate Board
Ref. Desig. 4451
Component Location



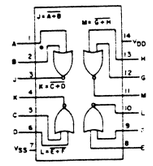
Combination and Filter Panel
Ref. Desig. 4461
Component Location



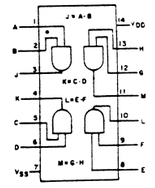
MC 1458



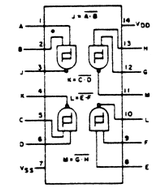
LM 311



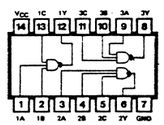
CD 4001



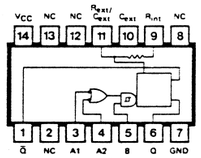
CD 4081



CD 4093



SN 7410 N



SN 74121 N

Note 1:

Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

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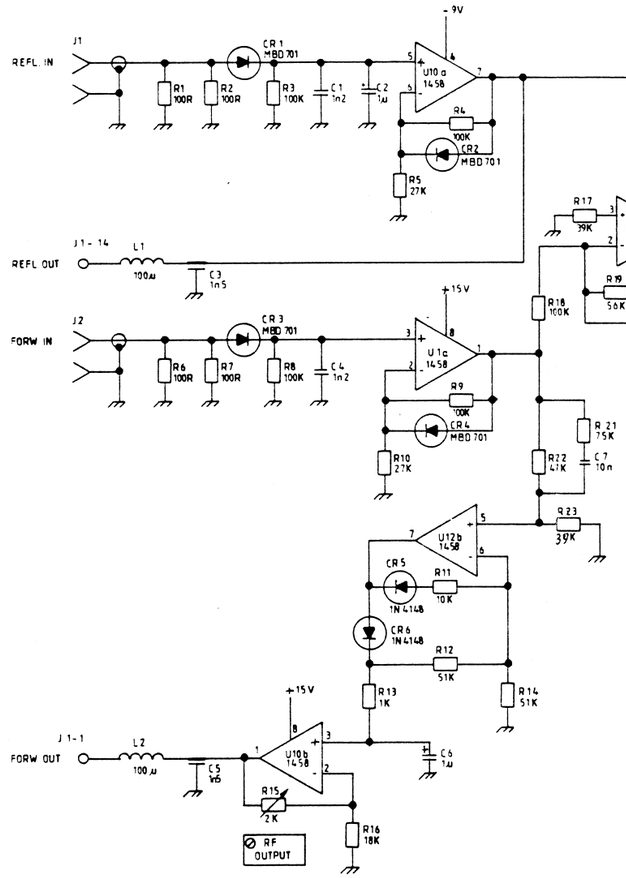
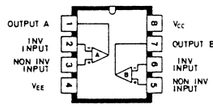
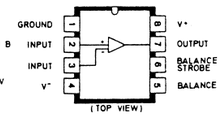


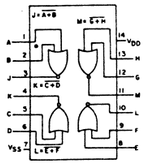
SWR COMPUTER AND ERROR LOGIC



MC 1458



LM 311



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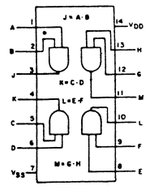

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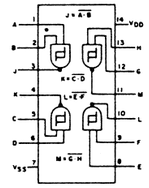

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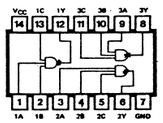

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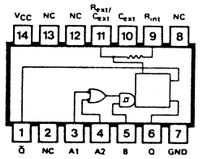

SN 74121 N

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Note 2:

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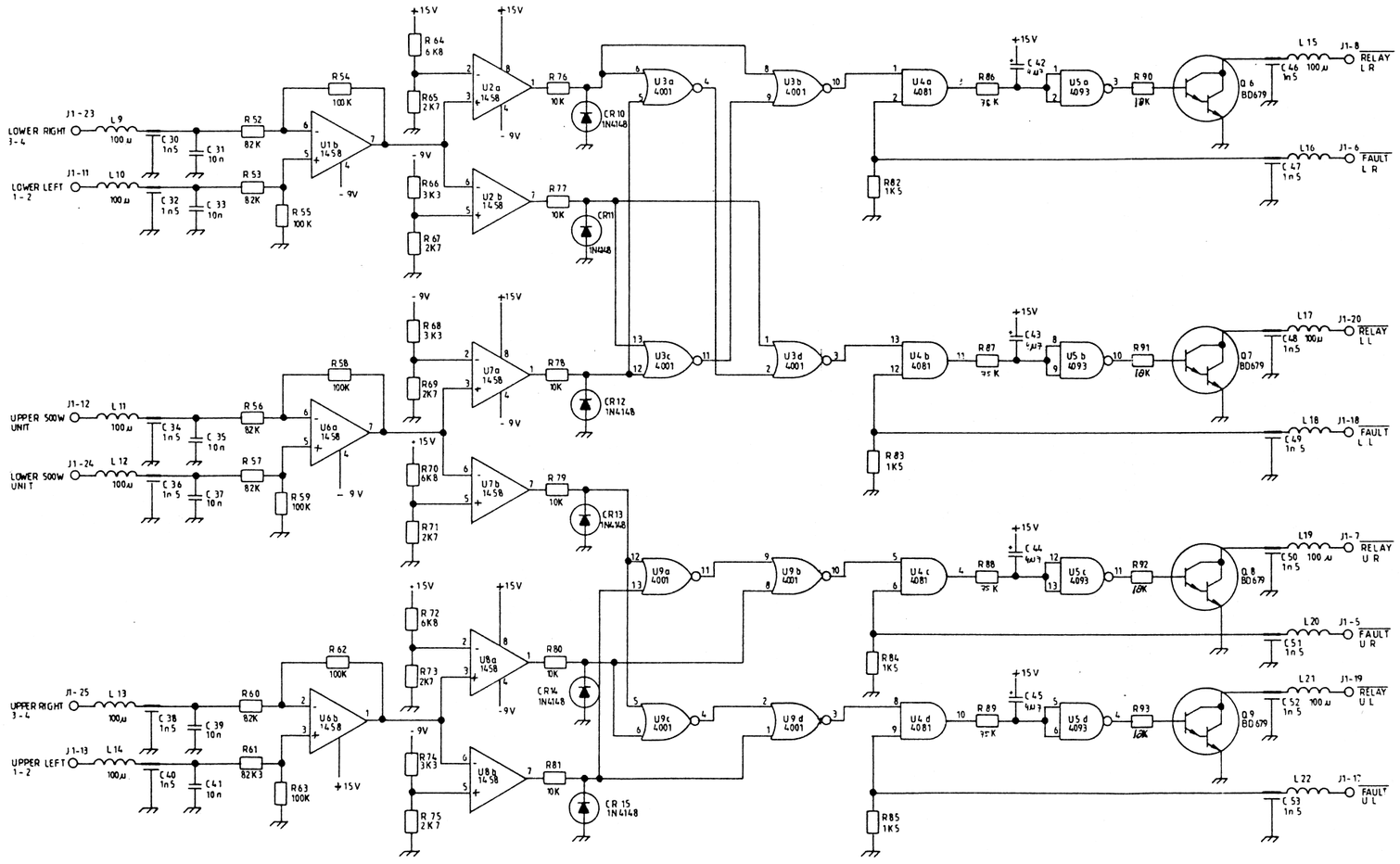


SWR COMPUTER AND ERROR LOGIC

PS 6150 POWER SUPPLY

1 Φ, 500 WATTS

CONTENTS Page

1. TECHNICAL SPECIFICATION

GENERAL.

The ELEKTROMEKANO 1-phase power supply PS 6150 is a 40V DC-supply designed to meet the DC-power requirements of the ELEKTROMEKANO ISB/SSB transmitter S 76210 and S 76150. Its unique construction and reliability makes it attractive in other applications where a 40V DC, 1500W power supply is needed.

The power supply employs a magnetic AC voltage stabilizer, a rectifier bridge and a LC ripple filter to achieve the specifications given.

The built-in mains switch relay is controlled by an external switch.

Two 40V DC/37A outputs are provided, each one of which can be turned off independently of the other by means of two built-in relays controlled by 50 ms ground pulses.

Front panel pushbuttons for reset of the two outputs are provided.

Outputs for two external blowers are provided as two 115V AC outputs.

The PS 6150 is designed to operate on either 50 Hz or 60 Hz.

Built-in fuses protect all inputs and outputs.

A fan stop detector circuit (pushbutton resettable at the front panel) protects the power supply in the event of blower failure.

MAINS VOLTAGES.

200V +/- 10%
220V +/- 10%
230V +/- 10%
240V +/- 10%
254V +/- 10%

NOTE: Information regarding 110V operation may be obtained by contacting B&W Elektronik, Taastrup, Denmark.

OUTPUT VOLTAGE.

Max. 45 V DC at 0% load
Max. 44 V DC at 3.8A
41.5V DC +/- 1V at 28A
Full load: 40.5V DC +/- 1V at 37.5A

RIPPLE VOLTAGE.

Max. 250mVp-p

BLOWER OUTPUTS.

2 x 115V AC +/- 10%
60 VA cos phi 0.6

MAINS POWER CONSUMPTION AT FULL LOAD.

2 kVA cos phi 0.9 at nominal mains voltage, change proportional to mains variations.

MAINS FREQUENCY.

50 Hz or 60 Hz, +/- 1 Hz

MAINS TRANSIENT SUPPRESSION.

30 dB

COOLING.

Built-in blower with stop detector.

ENVIRONMENTAL CONDITIONS.

Operating Temperature : -15°C to + 55°C.
Storage Temperature : -40°C to +70°C.
Relative Humidity : 95% at 40°C.

DIMENSIONS.

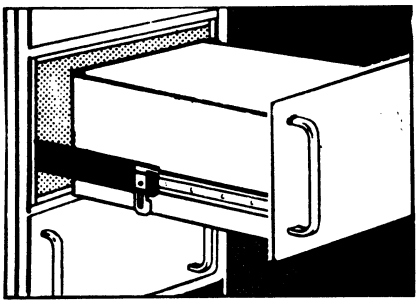
Panel Width: 19" (483 mm)
Panel Hight: 220 mm
Panel Depth: 470 mm

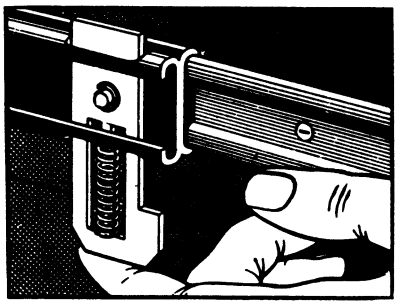
WEIGHT.

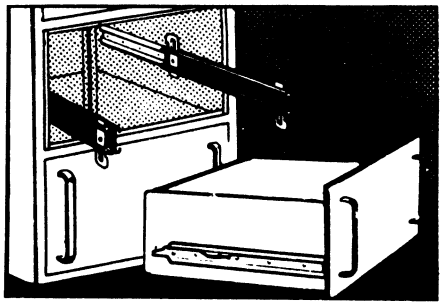
65 kg.

2. DESCRIPTION

2.1 MECHANICAL DESCRIPTION







The power supply panel-and-chassis assembly (drawer) is designed to be mounted on telescopic slides in a standard 19-inch cabinet rack.

The front panel is fastened to the cabinet rack by means of captive panel-mounting screws.

The telescopic slides are fitted with trigger latches which automatically and securely lock the unit in the withdrawn position, when fully extended.

The projecting latches are pressed (see drawing) to release the lock so that the drawer can be closed or completely removed from the cabinet rack.

Before removing a drawer from the cabinet, all plugs on the rear panel should be taken out of their sockets.

The chassis together with the transformer assembly and top cover make an extremely rigid construction.

The front panel carries two air-inlets covered with removable air filters, control lamps, fuses and reset pushbuttons.

The rear panel carries the fan and the input and output connections.

For location of the separate parts, see Chapter 9.3.

2.2 ELECTRICAL DESCRIPTION

2.2.1 CIRCUIT DIAGRAM: POWER SUPPLY. REF. DESIG. 4481

The power supply consists of a magnetically regulated transformer, a rectifier bridge and the necessary filtering circuits. Circuits for interface to the rest of the transmitter S 76210 or S 76150 are also included.

The primary voltage is applied to the transformer T1 through contactor K4 and thermo switch ST1. Contactor K4 is activated by a jumper between J2 pin 1 and 2. The necessary voltage to the contactor is taken from transformer T2.

Transformer T1 accepts primary voltages as indicated in the diagram; i.e., mains voltages in the range 200V to 254V or 100V and 127V.

Capacitor C5 is coupled in parallel to the resonance winding of T1 and forms a parallel resonance circuit. Regulation is based upon the parallel resonance circuit which provides either in-phase or out-of-phase current compared with the load current.

The AC output, now stabilized, is rectified by rectifier bridge consisting of CR2 through CR5 and smoothed by filter components L1 and C1 through C4.

The 40V DC output is fed to J3 via two fuses and two relays. Relays K2 and K3 are in turn controlled from an external fault detection circuit, which in case of faults applies a ground to J2 pins 3 or 4. Once the relays have broken they are held by contacts Nos. 7 and 6, and lamps DS1 or DS2 will light. When the fault has been corrected, the relays can be reset by the "Fuse Reset" knobs S2 and S3.

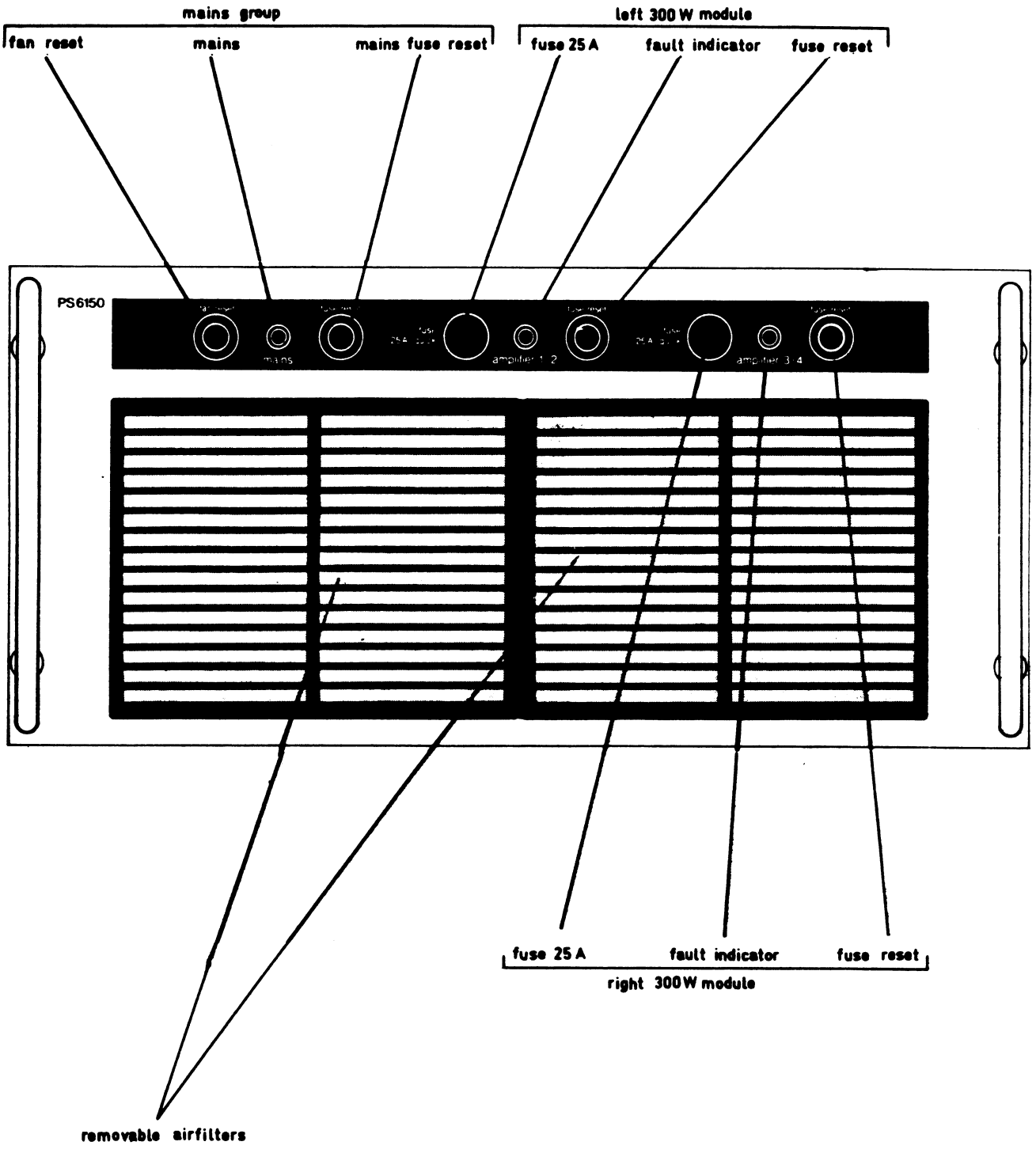
Transformer T1 also provides 110V AC for the blowers. One output is led through F5 on the fuse board to B1, which is the internal, power supply blower. One output is led through F6 to J3 pin 1. This output is normally used for the blower in the PA 6150 panel. The output is also used to supply the heating element in the "Fan Stop Detector" ST2.

The third 110V AC output is applied to J2 pin 6 and fused by F4. It is normally used to supply the blower in the CF 6210/CF 6150 panel.

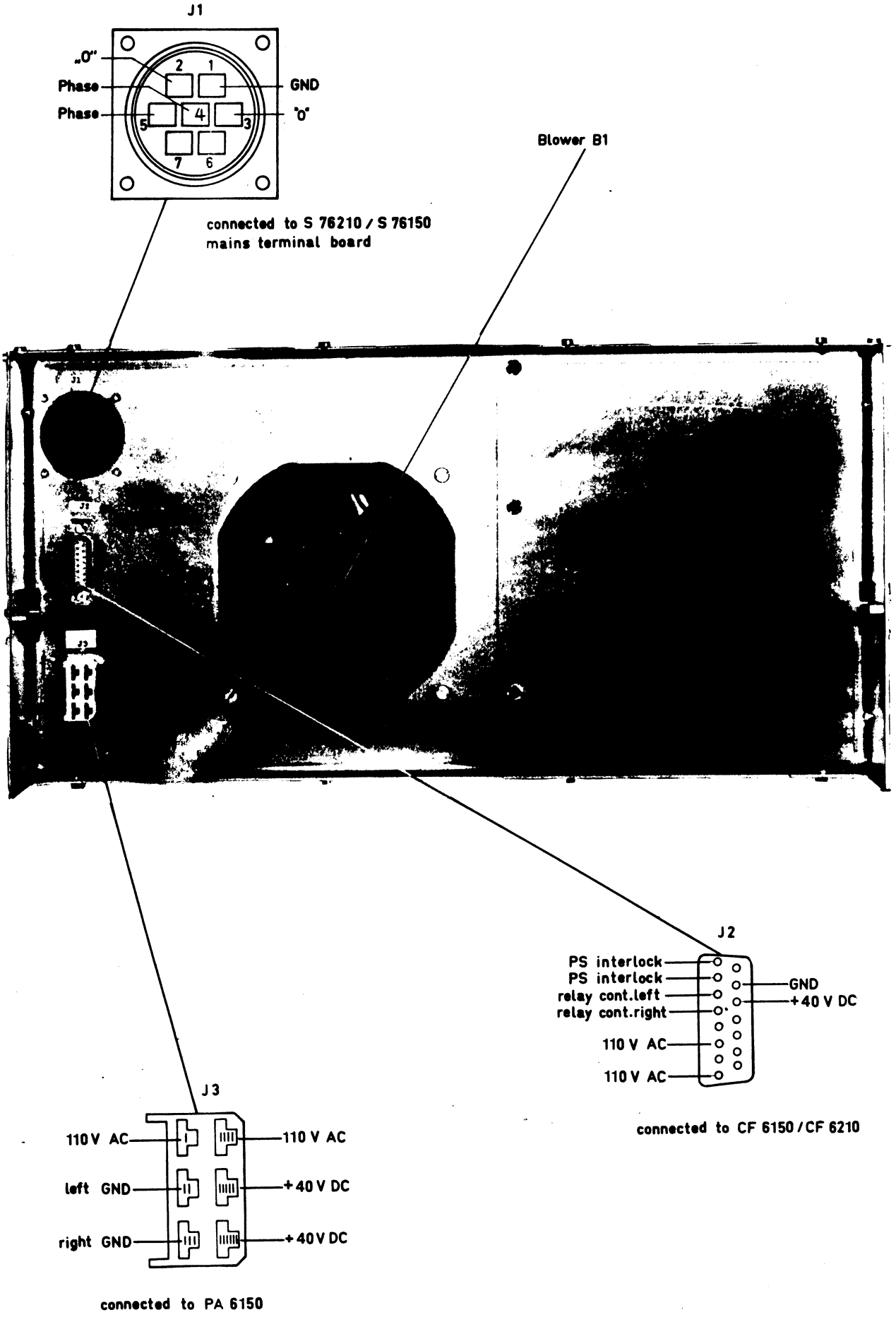
The CF 6210/CF 6150 must be supplied with +40V DC. This is taken from a point before fuses F1 and F2 via F7 on the fuse board and brought to J2 pin 11.

Transformer T2 is fused by F3. The output from this transformer is also used on the fuse board to provide the necessary DC voltage for relay K1. This relay forms part of the interlock circuit.

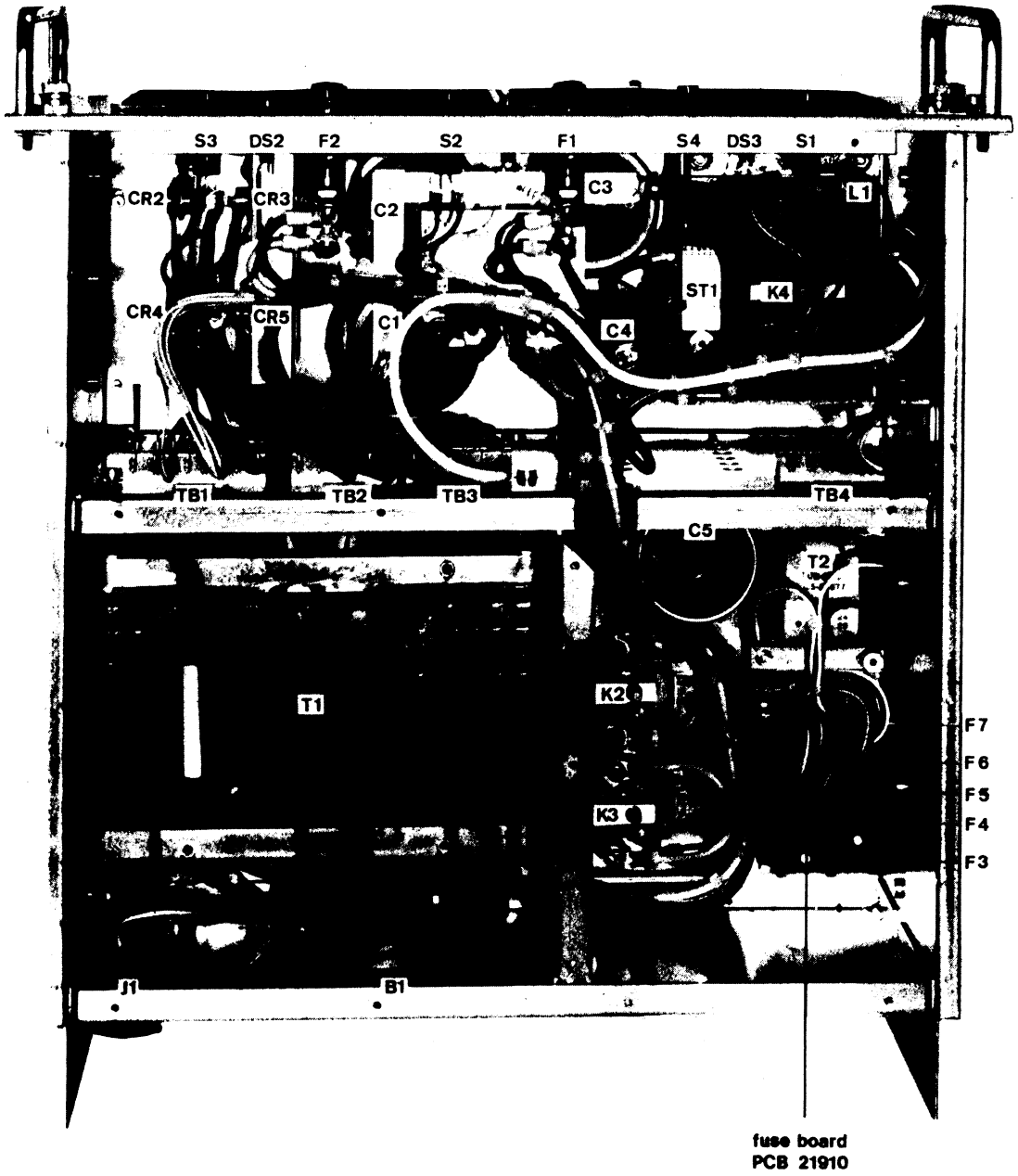
The interlock path goes through one side of the contactor coil, through pins Nos. 96 to 95 on ST1, contact Nos. 1 and 2 of K1 to J2 pin 2; return is on J2 pin 1. In case of blower failure in the power supply itself, the contact in the "Fan Stop Detector" will close and activate K1 causing the interlock path to break and the power supply switches off. When the fault has been corrected, the "Fan Reset" pushbutton must be pressed.



Front Panel
Ref. Desig. 4481

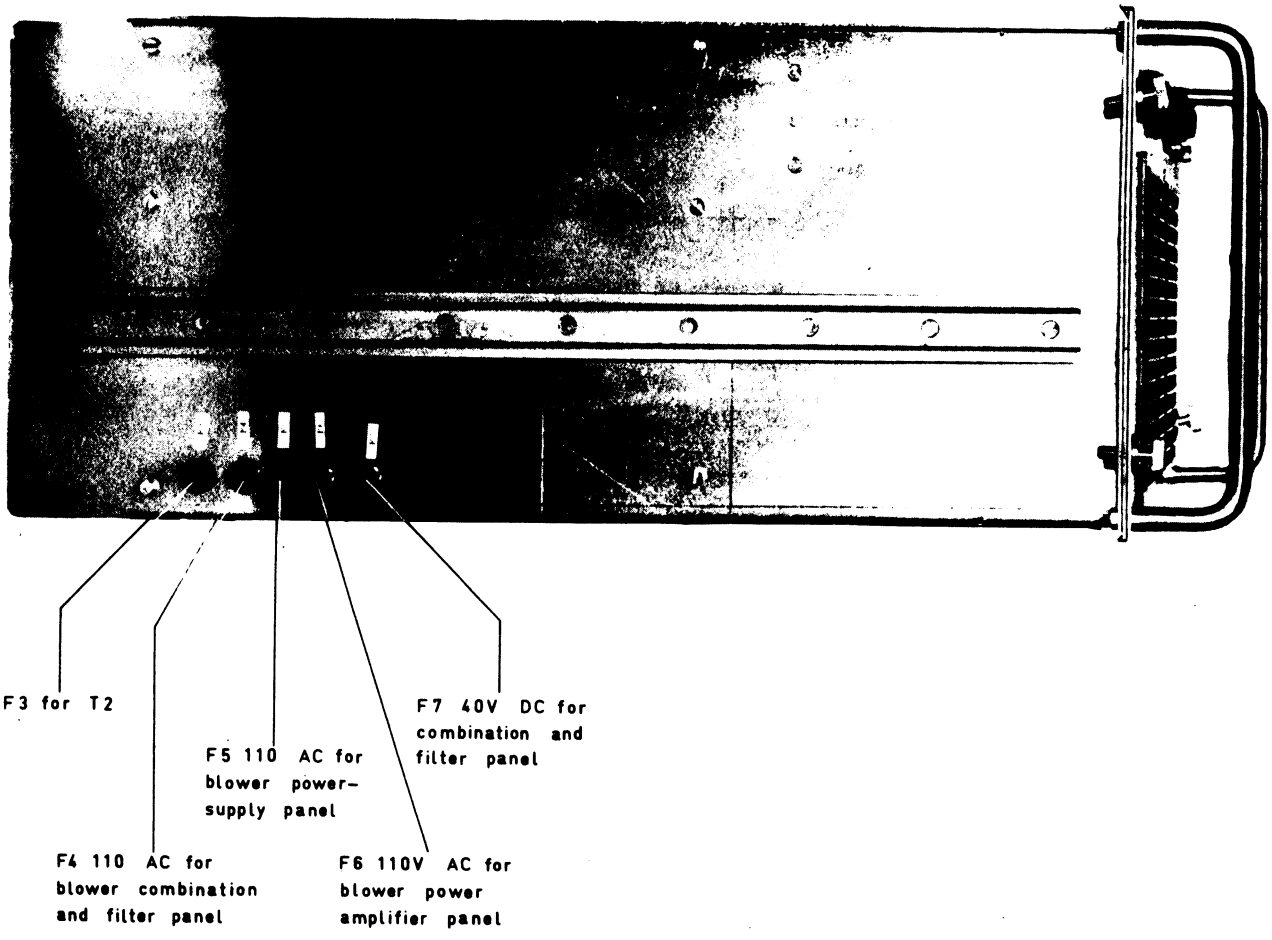


Rear Panel
Ref. Desig. 4481



Bottom view
Ref. Desig. 4481
Component Location

(Left-side panel, PS6150)



Side view
Ref. Desig. 4481

4. INSTRUCTIONS FOR INSTALLATION

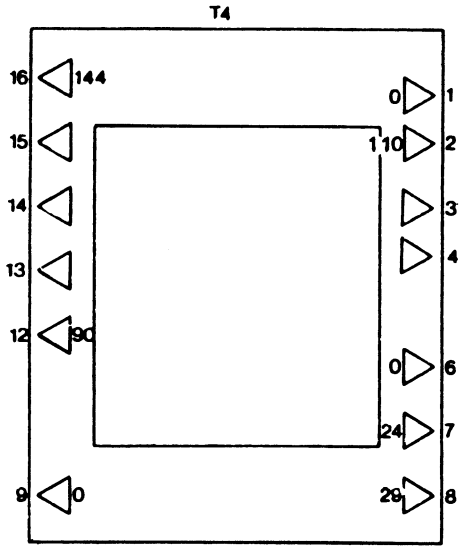
The PS 6150 one-phase power supply, which can be used to deliver the necessary voltages to the transmitters S 76210 and S 76150, has built-in capability for operation on a number of mains voltages. The only precaution that must be taken is to ensure that a number of connections have been made to various terminal boards in accordance with the mains voltage used.

Voltage at TB2, TB3 control the input to transformer T1. Change of voltage on T2 is performed on the transformer itself.

Below is a table of possible mains voltages and the necessary connections:

Mains Voltage	TB2 Pin No.		TB3 Pin No.		T4 Primary
phase to zero volt	red	black	black	white	brown
200	1	2	1	2	12
220	1	3	1	3	13
230	1	4	1	4	14
240	1	5	1	5	15
254	1	6	1	6	16

For 110 V operation please consult the factory.



5. OPERATING INSTRUCTIONS

The operation of the PS 6151/PS 6150 is limited to some "reset" functions.

ON/OFF switching is performed via connections to J2 pins 1 and 2.

The front panel photo in Section 3.1 of this manual shows the location of pushbuttons, fuses and control lamps.

MAINS GROUP

"Fan reset"	Resets the fan stop detector circuit.
"Mains lamp"	Lights when the power supply is on. No light indicates the power supply is not on, blower failure, thermo switch is off or lamp burn-out.
"Fuse reset"	Resets the thermo switch.
"Fuse 25 A"	Fuses the +40 V DC to the left 300-W PA module.

LEFT 300 W MODULE

"Fault indicator"	Lamp lights if the automatic fault detection circuit has switched the +40 V DC off to the left 300-W PA module, or if the 25 A fuse is blown.
"Fuse reset"	Resets the +40 V DC to the left 300-W PA module.
"Fuse 25 A"	Fuses the +40 V DC to the right 300-W PA module.

RIGHT 300 W MODULE

"Fault Indicator"	Lamp lights if the automatic fault detection circuit has switched off the +40 V DC to the right 300-W PA module, or if the 25 A fuse is blown.
"Fuse reset"	Resets the +40 V DC to the right 300-W PA module.

6. MAINTENANCE

6.1 ALIGNMENT PROCEDURE

The alignment of the PS 6151 is limited to adjustment of thermo switch ST1, when a change of mains voltage has taken place. The thermo switch can be adjusted to operate for currents from 8 A to 12 A. The table below shows the correct setting corresponding to the voltage the power supply can accept.

Supply Voltage	ST 1
200V	12A
220V	12A
230V	12A
240V	11A
254V	10A

6.2 PREVENTIVE MAINTENANCE

Preventive maintenance of the PS 6150 is limited to renewing the air-inlet filters when necessary, minimum every 3000 hours.

If the filters clog-up the fan stop detector will switch off the power supply.

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	41 BR394912	MOUNTING PL. PS6150 D4481	1			A1	
2	1,000	ST	60 BR396001	CONTACTOR AS.PS6150 220V	1			A2	
3	1,000	ST	60 BR373605	FUSE BRD. PS6150/51 D4422	1			A3	
4	1,000	ST	41 BR373931	REAR PLATE ASSY PS6150/51	1			A4	
5	2,000	ST	23 BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR9,CR10	
6	3,000	ST	28 BR373230	LAMP INCAND 24V 20MA	4			DS1,DS2,DS3	
7	2,000	ST	33 BR263214	FUSE 32X6,3MM 25A	4			F1,F2	
8	5,000	ST	33 BR262706	FUSE 20X5MM 1A TT	4			F3,F4,F5,F6,F7	
9	4,000	ST	51 BR275506	SCREW M 3 X 5 CHJ GULCR	4			H1	
10	4,000	ST	51 BR275514	SCREW M 3 X 6 CHJ GULCR	4			H2	
11	4,000	ST	51 BR333263	SCREW M 3 X 8 UHJ GULCR	4			H3	
12	1,000	SÆ	45 BR373265	TELESCOP.SLIDE,PAIR 17 3/	4			H3	
13	10,000	ST	51 BR275549	SCREW M 3 X12 CHJ GULCR	4			H4	A1
14	62,000	ST	51 BR275611	SCREW M 4 X 5 CHJ GULCR	4			H5	
15	11,000	ST	51 BR333395	SCREW M 4 X 6 UHJ GULCR	4			H6	
16	4,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H7	
17	28,000	ST	51 BR333409	SCREW M 4 X 8 UHJ GULCR	4			H8	A1
18	4,000	ST	51 BR275646	SCREW M 4 X10 CHJ GULCR	4			H9	
19	1,000	ST	51 BR333654	SCREW M 4 X40 CHJ GULCR	4			H10	
20	1,000	ST	51 BR275492	SCREW M 3 X 4 CHJ GULCR	4				A1
21	4,000	ST	51 BR447935	SCREW M 5 X12 HEX RUSTFRE	4			H12	
22	6,000	ST	51 BR403288	SCREW UNBRAK M 6X12 UHR	4			H13	
23	8,000	ST	53 BR245674	WASHER,NYLON Ø10MM	4			H17	
24	8,000	ST	53 BR321966	WASHER,FLAT Ø 5MM CU SN M	4			H18	
25	4,000	ST	53 BR336777	WASHER,FLAT Ø 4MM CU SN M	4			H19	
26	1,000	ST	52 BR327522	NUT M 4 M CU SN	4			H20	
27	19,000	ST	31 BR223255	CONN CRIMPFLAT 2,5MM2 6,3	4			H21	
28	4,000	ST	31 BR223263	CONN CRIMPFLAT 1,5MM2 6,3	4			H22	
29	2,000	ST	31 BR327778	KABELSKO 10MM2X6.5	4			H23	
30	2,000	ST	31 BR368490	CONN D ACCESS. LOCK.HOOK	4			H24	
31	2,000	ST	31 BR231134	TERMINAL LUG 4,20MM 1F	4			H25	
32	1,000	ST	45 BR377716	STRAP,CABLE L371XB3,7	4			H26	A1
33	6,000	ST	45 BR371157	STRAP,CABLE L 92XB2,6	4			H27	
34	0,500	M	44 BR377503	EDGING KANTLIST F/2,1-3MM	4			H28	
35	1,000	ST	32 BR377708	FLCABLE ACCESS SOKKELLIST	4			H29	
36	1,000	ST	48 BR425931	LABELS,DIAGRAM NO PS6150	3			H30	

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TITLE: PANEL PS6150 220V 500W

DOCUMENT NO.: 41 - BR357960 (357960)

REV: A2

SHEET NO.: 1 OF 3

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
37	12,000	ST	51 BR495247	SCREW PINOL M 5 X20 S UNB	4			H31	
38	12,000	ST	52 BR333980	NUT M 5 J GULCR	4			H32	
39	2,000	ST	33 227556-001	RELÆ, JUSTERET 21V	1				A2
40	1,000	ST	41 BR369292	CHASSIS PS6151	1			MP1	
41	1,000	ST	56 BR447757	SHORT CKT CLAMP PS6150	1			MP2	
42	1,000	ST	41 BR380938	PLATE PS6150	1			MP3	
43	1,000	ST	46 BR380946	BRACKET PS6150	1			MP4	
44	2,000	ST	52 BR387681	STAY NUT M3 X10 N5	3			MP5	
45	1,000	ST	41 BR380954	WALL PS6150	1			MP6	
46	1,000	ST	31 BR452807	CONTACT PIECE PS6150/51	1			MP7	
47	1,000	ST	41 BR368520	MOUNT.PL,FRONT PS6150/51	1			MP8	
48	1,000	ST	41 BR487031	FRONT PLATE PS6150	1			MP9	
49	4,000	ST	46 BR268682	GUIDE F/THUMBSCREW 260827	2			MP10	
50	4,000	ST	53 BR267015	WASHER,NYLON Ø12MM X15MM	3			MP11	
51	4,000	ST	51 BR260827	THUMBSCREW,KNURLED M6	3			MP12	
52	2,000	ST	43 BR359173	HANDLE F.8 3/4" 200MM	3			MP13	
53	2,000	ST	65 BR432288	FILTER,AIR ASSY P-P.CF PA	1			MP14	
54	1,000	ST	41 BR371831	TOP PLATE PS6150/51	1			MP15	
55	1,000	ST	56 BR452793	SPACER,PLATE PS6151/51	1			MP16	
56	2,000	ST	21 BR328790	RES FILM 1K00 1,6J PR37	4			R1,R2	
57	3,000	ST	33 BR373958	PUSH BTN SW SPST	4			S1,S2,S3	
58	1,000	ST	33 BR373966	PUSH BOTTON SW	4			ST1	
59	1,000	ST	36 BR405965	BLOWER ACCESS FANSTOPDET	4			ST2	
60	1,000	ST	25 BR379921	TRAFO,MAINS,MAGSTAB PS615	3			T1	
61	1,000	ST	25 BR373214	TRAFO,MAINS 110/110 24/29	4			T2	
62	1,000	ST	31 BR373761	TERMINAL BD 8P 6,3X0,8	4			TB1	
63	2,000	ST	31 BR373708	TERMINAL BD 6P 6,3X0,8	4			TB2,TB3	
64	1,000	ST	31 BR373818	TERMINAL BD 6P 6,3X0,8	4			TB4	
65	2,000	ST	37 BR447072	CABLE ASSY PS6150/51	1			W1	
66	2,000	ST	37 BR447080	CABLE ASSY PS6150/51	1			W2	
67	1,000	ST	37 BR387665	CABLE ASSY PS6150	1			W3	
68	1,000	ST	37 BR452815	CABLE ASSY PS6150/51	1			W4	
69	1,000	ST	37 BR452823	CABLE ASSY PS6150/51	1			W5	
70	2,000	ST	28 BR373974	LAMP ACCESS SOCKT T4.6	4			XDS1,XDS2	
71	1,000	ST	28 BR373990	LAMP ACCESS SOCKT T4.6	4			XDS3	
72	5,000	ST	33 BR373389	FUSE ACCES. HOLDER CAP	4			XF	

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TITLE: PANEL PS6150 220V 500W

DOCUMENT NO.: 41 - BR357960 (357960)

REV: A2

SHEET NO.: 2 OF 3

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
73	2,000	ST	33 BR368199	FUSE ACCES. HOLDER 6,3X32	4			XF1,XF2	
74	4,000	ST	52 BR327506	NUT M 3 M CW SN	4				A1
75	150,000	MM	34 201701-007	SLEEVING, SHRINK. 9.5MM B	4				A1
76	2,000	ST	52 BR321060	NUT M 4 M CU SN	4				A1
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	**********
	2,000	ST	BR453846	TX.S76210 1F.	1				
	1,000	ST	BR453854	TX.S76150 1F.	1				

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TITLE: PANEL PS6150 220V 500W

DOCUMENT NO.: 41 - BR357960 (357960)

REV: A2

SHEET NO.: 3 OF 3

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	4,000	ST	22 BR449695	CAP. ELEC 33M 63 T	4			C1,C2,C3,C4	
2	2,000	ST	23 BR369853	DIO POW.1N1186A SI200V 40	4			CR2,CR4	
3	2,000	ST	23 BR369861	DIO POW. 1N1186RA SI200V	4			CR3,CR5	
4	2,000	ST	51 BR327247	SCREW M 4 X12 CHM CU SN	4			H1	
5	4,000	ST	51 BR275697	SCREW M 4 X25 CHJ GULCR	4			H2	
6	2,000	ST	51 BR327298	SCREW M 5 X 8 CHM CU SN	4			H3	
7	4,000	ST	22 BR375780	CAP. ACCESS NUT	4			H4	
8	4,000	ST	22 BR375799	CAP. ACCESS WASH.RUBB.	4			H5	
9	4,000	ST	23 BR371777	DIO ACCESS HOLDER ISO	4			H6	
10	2,000	ST	31 BR335835	TERMINAL LUG 5,20MM 1F	4			H7	
11	1,000	ST	31 BR373583	CONN FLAT 6,3X0,8X3	4			H8	
12	4,000	ST	52 BR321060	NUT M 4 M CU SN	4			H9	
13	4,000	ST	51 BR333670	SCREW M 5 X12 CHJ GULCR	4			H10	
14	1,000	ST	25 BR405981	COIL,CHOKE 2M3	4			L1	
15	1,000	ST	41 BR380865	MOUNTING PLATE PS6150	1			MP1	
16	1,000	ST	31 BR380881	CONTACT PIECE PS6150	1			MP2	
17	2,000	ST	31 BR380989	CONTACT PIECE PS6150	1			MP3	
18	2,000	ST	56 BR371807	HEATSINK F/ DIO PS6150/51	3			MP4	
19	1,000	ST	21 BR375012	RES WIREW 1K5 11J	4			R3	
20	1,000	ST	37 BR398802	CABLE ASSY PS6150	1			W1	
21	1,000	ST	37 BR398799	CABLE ASSY PS6150	1			W2	
**********			**********	********** BILL OF DOCUMENTATION	**********			**********	**********
			BR4481 EC	1 PHASE POWER SUPPLY					
**********			**********	********** NEXT ASSY **********	**********			**********	**********
	1,000	ST	BR357960	PANEL PS6150 220V 500W	1				

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TITLE: MOUNTING PL. PS6150 D4481

DOCUMENT NO.: 41 - BR394912 (394912)

REV: A

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H1	
2	4,000	ST	51 BR275654	SCREW M 4 X12 CHJ GULCR	4			H2	
3	1,000	ST	33 BR466662	CONTACTOR CI25 24VAC	4			K4	B
4	1,000	ST	46 BR371769	BRACKET F.CONTACT PS6150	1			MP1	
5	1,000	ST	41 BR373729	MOUNTING PLATE PS6151-S12	1			MP2	
6	1,000	ST	33 BR375772	CKT BREAKER THERMO 10A	4			ST1	
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	*******
	1,000	ST	BR357960	PANEL PS6150 220V 500W	1				

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TITLE: CONTACTOR AS.PS6150 220V

DOCUMENT NO.: 60 - BR396001 (396001)

REV: B

SHEET NO.: 1 OF 1

A4 Form 200473 FB Rev A

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	37 BR371955	PWB,FUSE BD PS6150/51	3				
2	1,000	ST	23 BR214612	DIO BRDG.B80C 800 SI 800M	4			CR1	
3	1,000	ST	23 BR228141	DIO POW. 1N4007 SI 1KV 1A	4			CR0	
4	4,000	ST	51 BR275506	SCREW M 3 X 5 CHJ GULCR	4			H1	
5	1,000	ST	31 BR387274	CONN MOLEX 12P MALE	4			J4	
6	1,000	ST	31 BR387282	CONN MOLEX 15P MALE	4			J5	
7	1,000	ST	33 BR363170	RELAY 24V 740 2XCHG.	4			K1	
8	4,000	ST	52 BR387681	STAY NUT M3 X10 N5	3			MP1	
9	5,000	ST	33 BR373370	FUSE ACCES. HLDR 5X20 PWB	4			XF	
**********	**********	**	**********	**** BILL OF DOCUMENTATION	**	**********	**********	**********	******
			BR4422 EC BR373605 PD	3 PHASE POWER SUPPLY FUSR BRD PS6150-6151					
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	******
	1,000	ST	BR357960	PANEL PS6150 220V 500W	1				
	1,000	ST	BR358231	PANEL PS6151 F3/380-440	1				

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TITLE: FUSE BRD. PS6150/51 D4422

DOCUMENT NO.: 60 - BR373605 (373605)

REV: A

SHEET NO.: 1 OF 1

PARTS LIST

PRINTET..... 90/01/24
PARTS LIST PER.. 90/01/23

FIND NO.	QTY RQD	U M	ITEM OR DOCUMENT NUMBER	NOMENCLATURE	I T	PREP NO.	BIN	REFERENCE DESIGNATION	LINE REV
1	1,000	ST	36 BR367222 =201389-001	BLOWER 115V 50/60HZ	4			B1	
2	2,000	ST	22 BR449695	CAP. ELEC 33M 63 T	4			C6,C7	
3	4,000	ST	52 BR321060	NUT M 4 M CU SN	4			H1	
4	8,000	ST	51 BR275638	SCREW M 4 X 8 CHJ GULCR	4			H2	
5	4,000	ST	51 BR333468	SCREW M 4 X16 UHJ GULCR	4			H3	
6	0,135	M	46 BR260843	PAD,RUBBER ADHESIV 3,2X19	4			H6	
7	2,000	ST	22 BR375780	CAP. ACCESS NUT	4			H8	
8	2,000	ST	22 BR375799	CAP. ACCESS WASH. RUBB.	4			H9	
10	1,000	ST	41 BR369284	REAR PLATE PS6150/51	1			MP1	
11	2,000	ST	46 BR380946	BRACKET PS6150	1			MP2	
12	2,000	ST	56 BR452793	SPACER,PLATE PS6151/51	1			MP3	
**********	**********	**	**********	********** NEXT ASSY **********	**	**********	**********	**********	******
	1,000	ST	BR357960	PANEL PS6150 220V 500W	1				
	1,000	ST	BR358231	PANEL PS6151 F3/380-440	1				

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TITLE:	DOCUMENT NO.:	REV:	SHEET NO.:
REAR PLATE ASSY PS6150/51	41 - BR373931 (373931)	A1	1 OF 1

A4 Form 200473 FB Rev A

Note 1:

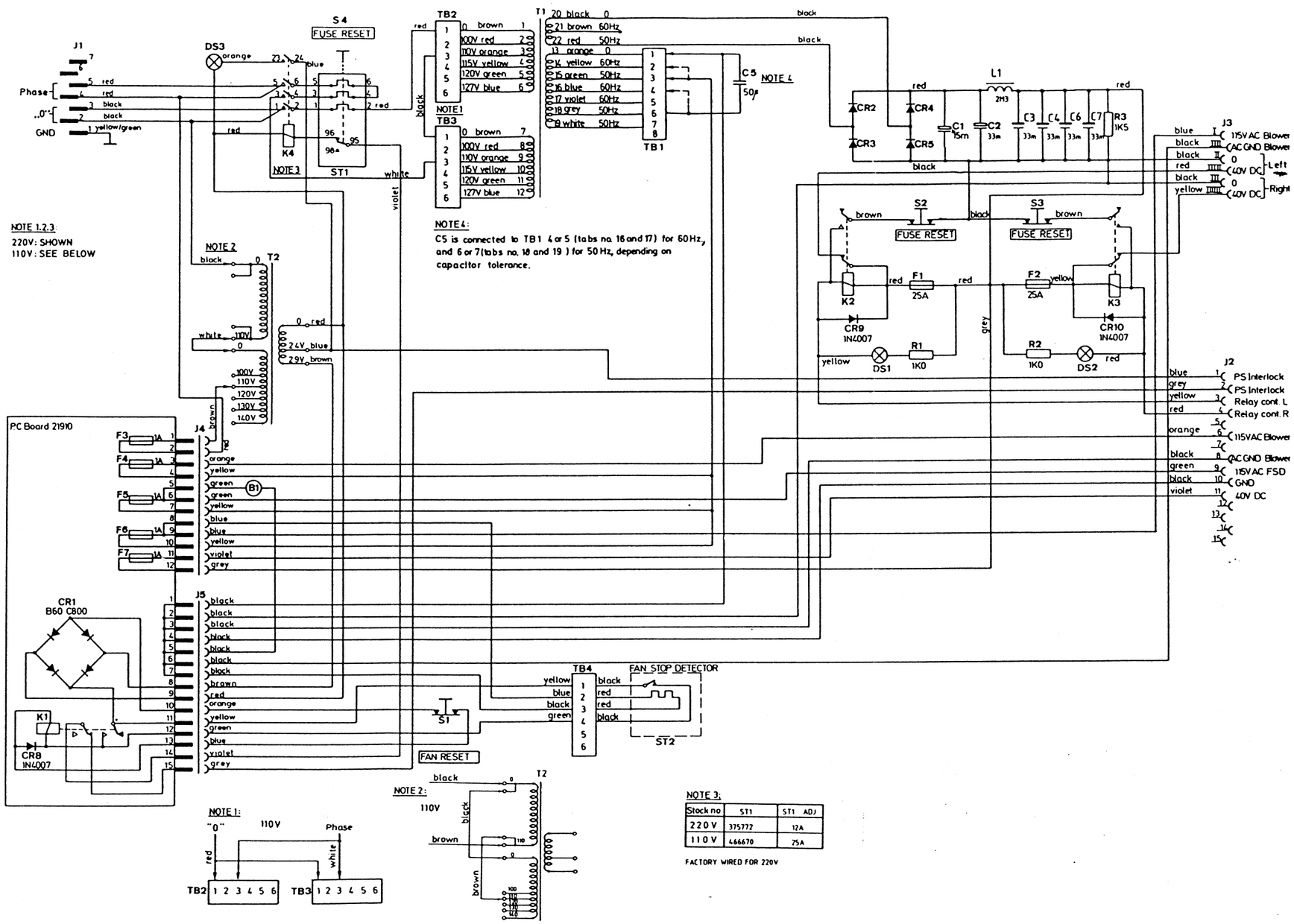
Partial Reference Designations are shown. For complete Designation prefix with Assembly and Subassembly Reference Designations (Circuit Diagram Nos.)

Note 2:

The code system used for indicating resistance values corresponds to that specified in IEC 62, with the exception that decimal fractions are used for values below 1Ω, e.g. 0,47 = 0,47Ω, but 4R7 = 4,7Ω.

The capacitance units are indicated by means of the international prefixes p, n, and µ, (pF, nF, and µF).

The inductance units are indicated by means of the international prefixes µ, and m, (µH, and mH).



1-Phase Power Supply
Ref. Designation 4481