MWO 55-1520-210-30-45

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON RADIO RECEIVER R-1963/ARN IN UH-1D/H HELICOPTER

HEADQUARTERS, DEPARTMENT OF THE ARMY

19 MARCH 1980

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D. C.

17 January 1989

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 2. Delete serial numbers 66-00954 and 69-15935 from paragraph 3 and add serial numbers 69-15475 and 70-15730.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, MWO Requirements for UH-1H/V Helicopters, Utility.

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D.C.

18 April 1988

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 1. NOTE at top of page is changed to read, "MWO effective date 1 October 1978 and completion date 1 December 1989."

Page 2, paragraph 6a is superseded as follows:

a. Time Compliance Schedule. MWO effective date 1 October 1978 and completion date 1 December 1989.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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-U.S. GOVERNMENT PRINTING OFFICE: 1988 - 554-030/80231

NORMAL

MWO 55-1520-210-30-45

CHANGE NO, 6

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D. C.
22 April 1987

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 2, paragraph 3. Add serial number UH-1V 66-16397 to list of aircraft to be modified in proper numerical order.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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NORMAL

MWO 55-1520-210-30-45
CHANGE NO. 5

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D. C.
20 August 1985

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 1. NOTE at top of page is changed to read, "MWO effective date 1 October 1978 and completion date 30 September 1987. "

Page 2, paragraph 3. Add serial number 69-15946 to list of aircraft to be modified in proper numerical order.

Page 2, paragraph 3. Delete serial number 69-15308.

Page 2, paragraph 6a is superseded as follows:

a. Time Compliance schedule. MWO effective date 1 October 1978 and completion date 30 September 1987.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, MWO requirements for UH-1D/H/V/EH-1H aircraft.

*U.S. Government Printing Office 1985–564-030/20083

MWO 55-1520-210-30-45
Change No. 4

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Deportment of the Army, Washington, D. C.

1 February 1984

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 2, paragraph 3. Add serial numbers 68-16229, 69-15308, 71-20332, 72-21589 and 73-21691 to list of aircraft to be modified in proper numerical order.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, MWO Requirements for UH-1D/H, EH-1H aircraft.

MWO 55-1520-210-30-45
Change No. 3

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D. C.

26 August 1983

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 1. NOTE at top of page is changed to read, "MWO effective date 1 October 1978 and completion date 30 September 1984."

Page 2, paragraph 6a is superseded as follows:

a. Time Compliance Schedule. MWO effective date 1 October 1978 and completion date 30 September 1984.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, MWO Requirements for UH-1D/H, EH-1H aircraft.

*U.G. GOVERNMENT PRINTING OFFICE: 1983-664-028/2263

MWO 55-1520-210-30-45

CHANGE No. 2

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON

RADIO RECEIVER R-1963/ARN

IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D.C.
28 August 1982

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Page 2, paragraph 3. Add serial number 66-0853 and delete serial numbers 66-1127, 69-15474, 69-15481 and 69-15915.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, MWO requirements for UH-1D/H and EH-1H aircraft.

*U.S. GOVERNMENT PRINTING OFFICE: 1982-564-029/1253

MWO 55-1520-210-30-45
Change No. 1

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON
RADIO RECEIVER R-1963/ARN
IN UH-1H/V HELICOPTER (MEDEVAC)

Headquarters, Department of the Army, Washington, D. C.
14 April 1981

MWO 55-1520-210-30-45, 19 March 1980, is changed as follows:

Title is changed as shown above.

Page 2, paragraph 3 is superseded as follows:

3. End Item or System to be Modified,

NOTE

Prototype kit was installed on S/N 66-894. Proof kite were installed on S/N 68-15380 and 73-21684.

The following helicopters will be modified in accordance with instructions contained in paragraph 10.

Nomenclature	National Stock Number	Model	Serial Number
Helicopter	1520-00-087-7637	UH-1H (MEDIVAC)	66-0873, 66-0890, 66-0941, 66-0954, 66-1018, 66-1046, 66-1050, 66-1052, 66-1068, 66-1086,66-1087, 66-1104, 66-1105, 66-1127, 66-1193, 66-16005, 66-16013, 66-16034, 66-16108, 66-16119, 66-16143, 66-16155, 66-16187, 66-16201, 66-16228, 66-16239, 66-16243, 66-16252, 66-16272, 66-16291, 66-16296, 66-16316, 66-16328, 66-16355, 66-16366, 66-16372, 66-16387, 66-16395, 66-16415, 66-16419, 66-16431, 66-16446, 66-16456, 66-16475, 66-16478,

Nomenclature	National Stock Number	Model	Serial Number
			66-16484, 66-16506, 66-16508, 66-16513, 66-16525, 66-16538, 66-16609, 66-16620, 66-16633, 66-16639, 66-16678, 66-16680, 66-16717, 66-16729, 66-16757, 66-16821, 66-16827, 66-16836, 66-16868, 66-16877, 66-16879, 66-16894, 66-16896, 66-16965, 66-16969, 66-16971, 66-16972, 66-16998, 66-17004, 66-17013, 66-17024, 66-17030, 66-17054, 66-17081, 66-17089, 66-17091, 66-17099, 66-17100, 66-17111, 66-17144, 67-17146, 67-17189, 67-17198, 67-17200, 67-17216, 67-17220, 67-17236, 67-17258, 67-17268, 67-17289, 67-17292, 67-17334, 67-17406, 67-17414, 67-17416, 67-17455, 67-17523, 67-17526, 67-17527, 67-17534, 67-17535, 67-17540, 67-17547, 67-17599, 67-17637, 67-17645, 67-17661, 67-17725, 67-17781, 67-17808, 67-17810, 67-17813, 67-17814, 67-19494, 67-19521, 67-19534, 68-15214, 68-15227, 68-15431, 68-15444, 68-15461, 68-15492, 68-15526, 68-15532, 68-15543, 68-15550, 68-15592, 68-15593, 68-15622, 68-15678, 68-15688, 68-15743, 68-15749, 68-15754, 68-15773, 68-16077, 68-16084, 68-16138, 68-16165, 68-16174, 68-16187, 68-16235, 68-16252, 68-16261, 68-16263, 68-16321, 68-16349, 68-16355, 68-16415, 68-16417, 68-16421, 68-16446, 68-16507,

Nomenclature	National Stock Number	Model	Serial Number
			68-16519, 68-16553, 68-16563, 68-16596, 69-15002, 69-15016, 69-15053, 69-15062, 69-15081, 69-15102, 69-15144, 69-15171, 69-15180, 69-15208, 69-15219, 69-15229, 69-15247, 69-15249, 69-15253, 69-15267, 69-15268, 69-15271, 69-15282, 69-15294, 69-15298, 69-15322, 69-15323, 69-15326, 69-15330, 69-15331, 69-15332, 69-15339, 69-15341, 69-15370, 69-15408, 69-15425, 69-15469, 69-15474, 69-15481, 69-15518, 69-15545, 69-15636, 69-15683, 69-15719, 69-15730, 69-15758, 69-15790, 69-15814, 69-15818, 69-15844, 69-15845, 69-15848, 69-15854, 69-15913, 69-15915, 69-15924, 69-15926, 69-15928, 69-15929, 69-15930, 69-15931, 69-16652, 69-16719, 69-16727, 70-15711, 70-15754, 70-15860, 70-16209, 70-16224, 70-16225, 70-16238, 70-16248, 70-16249, 70-16259, 70-16262, 70-16266, 70-16280, 70-16309, 70-16360, 70-16361, 70-16364, 70-16368, 70-16370, 70-16371, 70-16372, 70-16373, 70-16378, 70-16379, 70-16380, 70-16381, 70-16382, 70-16383, 70-16385, 70-16386, 70-16387, 70-16389, 70-16390, 70-16391, 70-16392, 70-16393, 70-16394, 70-16422, 70-16437, 70-16439, 70-16440, 70-16464, 70-16465, 70-16468, 71-20009, 71-20018, 71-20023,

Nomenclature	National Stock Number	Model	Serial Number
			71-20024, 71-20026, 71-20050, 71-20063, 71-20088, 71-20105, 71-20156, 71-20159, 71-20164, 71-20177, 71-20206, 71-20214, 71-20223, 71-20228, 71-20247, 71-20271, 71-20280, 71-20284, 71-20285, 71-20294, 71-20300, 71-20301, 71-20302, 71-20303, 71-20305, 71-20306, 71-20307, 71-20315, 72-21508, 72-21517, 72-21533, 72-21547, 72-21559, 72-21629, 72-21638, 73-21664, 73-21666, 73-21689, 73-21717, 73-21718, 73-21719, 73-21720, 73-21732, 73-21745, 73-21748, 73-21756, 73-21763, 73-21765, 73-21767, 73-21778, 73-21791, 73-21807, 73-21820, 73-21832, 73-21859, 73-22066, 73-22067, 73-22080, 73-22091, 73-22097, 74-22298, 74-22299, 74-22311, 74-22312, 74-22341, 74-22354, 74-22366, 74-22372, 74-22373, 74-22376, 74-22377, 74-22398, 74-22407, 74-22421, 74-22425, 74-22428, 74-22430, 74-22431, 74-22432, 74-22433, 74-22442, 74-22447, 74-22463, 74-22468, 74-22472, 74-22473, 74-22482, 74-22498, 74-22542

Page 3, paragraph 6c “MOS35L” is changed to read “MOS35K.”

Page 6, paragraph 8a NSN “3439-00-460-1733” is changed to read ‘‘5940-00-460-1733.”

Page 7, paragraph 10b(1))a) is superseded as follows:

(a) Remove receiver R-1388/ARN-82.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, MWO requirements for UH-1D/H and EH-1H aircraft.

*U.S. GOVERNMENT PRINTING OFFICE: 1981 -765-035/160

NORMAL
MWO effective date 1 October 1978 and completion date 31 January 1984.

MWO 55-1520-210-30-45

DEPARTMENT OF THE ARMY MODIFICATION WORK ORDER

INSTALLATION OF GLIDESLOPE/MARKER BEACON RADIO RECEIVER R-1963/ARN IN UH-1D/H HELICOPTER

Headquarters, Department of the Army, Washington, D. C.

19 March 1980

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-210- cated in the back of this manual direct to: Commander, U. S. Army Troop Support & Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished directly to you.

1. Purpose of Modification.

The purpose of this modification is to provide a glideslope/marker beacon capability and is required to achieve compatibility with other equipment with which the affected equipment will be operated.

2. Priority Classification.

This modification is classified as NORMAL.

a. Equipment in Use (Including Equipment in Supply or Maintenance Activities Below Depot Level, and Equipment in Administrative Storage). Equipment in use will be modified as soon as practicable, but no later than the scheduled completion date. Equipment not modified after expiration of MWO completion date will be reported as NORM/NOT READY in accordance with applicable Army regulations.

b. Equipment in Wholesale Depot Supply or Maintenance Activities. All MWOs, to include MWOs which have been incorporated into DMWRs, will be accomplished on serviceable materiel prior to issue and/or subsequent to scheduled completion date. Operational project stock stored at the depots will be modified concurrently with depot stock. Issue of unmodified materiel is prohibited. The MWO will be applied to unserviceable materiel during scheduled depot maintenance.

c. Prepositioned Stock. Equipment which is propositioned will be modified during cyclic maintenance and will be consistent with TM 38-750.

3. End Item or System to be Modified.

NOTE

Prototype kit was installed on S/N 66-894. Proof kits were installed on S/N 68-16380 and 73-21684.

The following helicopters will be modified in accordance with instructions contained in paragraph 10:

Nomenclature	National Stock Number	Model	Serial Number*
Helicopter	1520-00-859-2670	UH-1D	66-746 thru 66-1104
Helicopter	1520-00-087-7637	UH-1H	66-1106 thru 66-1210
			66-8574 thru 66-8577
			66-16000 thru 66-16013
			66-16015 thru 66-16396
			66-16398 thru 66-16593
			66-18595 thru 66-17086
			66-17088 thru 66-17144
			67-17145 thru 67-17859
			67-18411 thru 67-18413
			67-18558 thru 67-18577
			67-19475 thru 67-19537
			68-15214 thru 68-15483
			68-15485 thru 68-15794
			68-18050 thru 68-16173
			68-16175 thru 68-16628
			69-15000 thru 69-15340
			69-15342 thru 69-15576
			69-15595 thru 69-15597
			69-15603
			69-15605 thru 69-15705
			69-15707 thru 69-15712
			69-15714 thru 69-15755
			69-15849 thru 69-15959
			69-16606
			69-16650 thru 69-16679
			69-16692 thru 69-16712
			69-16714 thru 69-16732
			70-15706 and 70-15707
			70-15711 thru 70-16239
			70-16241 thru 70-16279
			70-16281 thru 70-16283
			70-16285
			70-16288 thru 70-16417
			70-16422 thru 70-16452
			70-16454 thru 70-16463
			70-16466 thru 70-16518
			71-20000 thru 71-20046
			71-20048 and 71-20049
			71-20051 thru 71-20165
			71-20167 thru 71-20212
			71-20214 thru 71-20219
			71-20221 thru 71-20258
			71-20261 thru 71-20284
			71-20286 thru 71-20305

Nomenclature	National Stock Number	Mode	Serial Number*
			71-20308 thru 71-20333 72-21465 thru 72-21480 72-21482 and 72-21483 72-21485 thru 72-21509 72-21512 thru 72-21516 72-21518 thru 72-21591 72-21598 thru 72-21628 72-21630 thru 72-21648 73-21663 thru 73-21670 73-21672 thru 73-21790 73-21792 thru 73-21806 73-21808 thru 73-22099 73-22101 73-22122 thru 73-22135 74-22295 thru 74-22352 74-22354 thru 74-22379 74-22383 thru 74-22540 74-22541 thru 74-22543 76-22670 thru 76-22672

* Any aircraft which has had MWO 55-1520-210%0/3 applied (2nd OMNI plus R-844 Glideslope) should not be modified per this MWO.

4. Modules (Components, Assemblies, Subassemblies, Boards and Cards) to be Modified.

Not applicable.

6. Parts to be Modified.

Not applicable.

6. Application.

a. Time Compliance Schedule. MWO effective date 1 October 1978 and completion date 31 January 1984.

b. Level of Maintenance. Aviation Intermediate Maintenance (AVIM).

c. Applied By. This modification shall be applied by an avionics communication repairman, MO S35L, and airframe repairman, MOS68G.

d. Time Required.

(1) Total of 82 manhours using two men.

(2) Total of 41 hours downtime for one end item.

e. MWOs to be Applied Prior to or Concurrently with the MWO. The following modification work orders must be accomplished prior to this modification as applicable by model year:

MWO 55-1520-210-30/16, FY 66 MWO 55-1520-210-30/22, FY 67

f. Additional Information. Not applicable.

7. Technical Publications Affected/Changed as a Result of this MWO:

TM 55-1520-210-10, 18 May 79
TM 55-1520-210-23 Series, 20 Feb 79
TM 551520-210-23P, 1 Mar 77
TM 11-1520-210-20, 23 Jul 70
TM 11-1520-210-35, 29 Jul 70
TM 11-1520-210-20P, 26 Mar 73
TM 11-1520-210-34P, 2 Apr 73
TM 11-1520-210-20-1, 15 May 73
TM 11-1520-210-20-P-1, 15 May 73
TM 11-1520-210-34-1, 15 May 73
TM 11-1520-210-34P-1, 15 Mar 73

8. Supply Kits/Parts and Disposition.

a. Kit/Parts Required to Accomplish MWO.

National Stock Number	Nomenclature	Part No.	Qty
1560-01-039-5938	Kit, Modification Consisting of the following parts:	1560-UH1-806-1	1
*	Mounting Bracket	1560-UH1-786	1
*	Crossbrace	1560-UH1-780	1
****	Crossbrace Extension	1560-UH1-791	1
***	Doubler Plate	1560-UH1-781	1
**	Decal, RPM Warning	1560-UH1-792-3	1
**	Decal, R1963/ARN	1560-UH1-792-1	1
**	Marking Band R1963-2A	1560-UH1-794	1
**	Marking Band 1P1	1560-UH1-797	1
**	Marking Band R1963-1A	1560-UH1-795	1
**	Marking Band P2	1560-UH1-799	1
†	Cable Assembly Marker Beacon	1560-UH1-789-2	1
††	Cable Assembly R1963 Receiver	1560-UH1-789-1	1
**	Coaxial Cable Marker Beacon Ant	1560-UH1-790	1
**	Cable, Coaxial Glideslope Ant	1560-UH1-793	1
5340-00-598-8251	Bracket, Angle	AN743-12	3
5925-00-929-7716	Circuit Breaker	MS26574-1	1
5340-00-726-9819	Clamp, Loop	MS21919DG3	10
5340-00-598-0597	Clamp, Loop	MS21919DG8	2
5340-00-598-4195	Clamp, Loop	MS21919DG16	1
5340-00-664-2369	Clamp, Loop	MS21919DG26	1
5935-00-823-0487	Connector	UG88E/U	2
5310-0-208-9255	Nut, Self Locking	MS21044C3	37
**	Placard, R1963	1560-UH1-792-2	1
**	Placard, Blank	1560-UH1-792-4	1
5940-00-204-8966	Terminal Lug	MS25036-102	5
5999-00-812-2082	Contact	MS24255-20S	25
5999-00-901-3239	Contact	MS24254-20P	10
5365-00-293-9800	Spacer, Sleeve	NAS43DD3-24	6
5340-00-283-0649	Clamp, Loop	MS21919DG7	3
5940-00-143-4771	Terminal Lug	MS25036-103	3
5305-00-059-3659	Screw, Machine	MS51958-63	6
5305-00-059-3660	Screw, Machine	MS51958-64	22
5305-00-059-3661	Screw, Machine	MS51958-65	3
5305-00-059-3662	Screw, Machine	MS51958-66	2
5305-00-059-3665	Screw, Machine	MS51958-39	2
5305-00-059-3666	Screw, Machine	MS51958-70	2
5305-00-576-7810	screw	AN525D10R10	4
5310-00-894-4876	Washer, Flat	NW10-4373	3
5310-00-619-1148	Washer, Flat	MS15795-808	33
5310-00-167-0753	Washer, Flat	AN960PD10L	3
5320-00-117-6937	Rivet Solid	MS20426AD3-3	6
5320-00-117-6516	Rivet Solid	MS20470AD4-3	10
5320-00-117-6826	Rivet Solid	MS20470AD4-4	20

National Stock Number	Nomenclature	Part No.	Qty
5320-00-754-0822	Rivet Solid	MS20470AD4-5	17
5940-00-427-1069	Splice, Conductor	D142-52	4
5975-00-074-2072	Strap Tiedown, Elect	MS3367-1-9	2 4
4710-00-089-4533	Tube, Spiral Wrap	LP 390	A R
5975-00-156-3253	Strap Tiedown, Elect	MS3367-2-9	24
3439-00-4601733	Splice, Conductor	D142-50	2
5970-00-812-2969	Insulation Sleeving	RNF 100, Type 1, 1/8 in.	A R
5365-00-622-1810	Spacer, Sleeve	NAS43DD3-8	3
5975-00-570-9598	Strap Tiedown, Elect	MS3367-7-9	24
5975-00-111-3208	Strap Tiedown, Elect	MS3367-5-9	24
**	Glideslope Ant Assy	1560-UH1-805	1

† For future support assemble from: 2 each, NSN 5935-00-724-7159; 1 each NSN 5935-00-331-9841; AR, NSN 5970-00-994-1329; 2 each, NSN 5940-01-010-1571; 1 each, NSN 5940-00-427-1069; AR, NSN 6145-01-004-7663; AR, NSN 6145-00-578-7520; 27 each, NSN 5999-00-239-3338; AR NSN 6145-00-578-7519; 1 each, NSN 5935-00-976-5425

†† For future support assemble from: AR, NSN 5970-00-994-1329; 2 each, NSN 5940-00-427-1069; AR NSN 6145-01-004-7663; AR, NSN 6145-00-578-7520; AR, NSN 6145-00-578-7519

* Nonmaintenance significant

** CERCOM supported item

*** For future support fabricate from: .032 thk, 2024T3, alum sht QQ-A-250/4, NSN 9535-00-232-8846

**** For future support fabricate from: .063 thk, 2024T3, alum sht, QQ-A-250/4, NSN 9535-00-232-8825

b. Size and Weight of Kits.

Weight (Pounds)	Dimensions (Inches)	Cube (Feet)
20	18x20x16	3.3

c. Distribution and Issue Instructions.

(1) US Forces. Do not requisition kits. They will be shipped automatically as detailed in the Memorandum of Understanding (MOU).

(2) US Army Depots. Requisition required kits through supply channels.

(3) Multiservice. Special instructions shall be included for multi-service MWOs.

(4) MAP/MAS Countries. Special shipping instructions shall be provided for MAP/MAS countries.

d. Bulk and Consumable Materials. The following materials are not furnished with the kit and will be requisitioned to comply with this modification:

NSN	Nomenclature	Qty	Part No.	Source
5350-00-224-7205	Paper, Abrasive	A R	PP101	GO
3439-00-224-3567	Solder, Tin Alloy	A R	QQS571SN60	S9G
4020-00-202-1924	Twine, Fibrous	A R	MIL-T-713	S9I
8010-00-985-0751	Lacquer, Olive Drab	A R	TTL32	GO
8010-00-616-9144	Enamel, Gray	A R	TTE527	GO
8030-00-891-3113	Sealer	A R	RP1257-3A	GO
8010-00-297-0593	Primer, Coating	A R	TTP1757	GO
8030-00-811-3723	Corrosion Resistant	A R	MILC-5541	GO

NSN	Nomenclature	Qty	Part No.	Source
6145-00-578-7520	Wire, Electrical	AR	M5086/1-22-9	S9I
8030-00-753-5008	Sealing Compound	AR	MIL-S-8802D	GO
6145-00-578-7519	Wire, Electrical	AR	M5086/1-20-9	S9I
5350-00-221-0872	Cloth, Abrasive	AR	PC458C	GO

e. Additional Items. The following items while not a part of the kit, are required to complete the modification and should be requisitioned.

NSN	Nomenclature	Qty	Part No.	Source
5826-00-106-1722	Indicator, Course	1	ID-1347C/ARN-82	B16
5826-01-015-1574	Receiver	1	R1963/ARN	B16
5826-00-149-1399	Control	1	C-6873B/ARN-82	B16
5826-01-022-9257	Mount	1	MT-4835/ARN	B16

NOTE

Do not start modification procedures unless indicator ID 1347C/ARN-82 and control C-6873B/ARN-82 are on hand.

f. Parts Disposition. The following items (if installed) shall be returned to depot (mark for inspection and stock):

NSN	Nomenclature	Part No.	Qty
5826-00-837-7261	Receiver	R-1041/ARN	1
5826-00-402-5317	Indicator	ID1347/ARN-82	1
5826-00-168-8397	Indicator	ID1347A/ARN-82 or ID-1347B/ARN-82	1
5826-00-920-7107	Control	C6873/ARN-82 or C-6873A/ARN-82	1

9. Special Tools, Jigs, Test Measurement and Diagnostic Equipment (TMDE), and Fixtures Required.

NSN	Nomenclature	Part No.	Qty
5133-01-046-4974	Drill, Twist	500-12 1-16	1
5133-01-046-4975	Drill, Twist	500-12 1-8	1

10. Modification Procedures (Authority ECP UH-001).

NOTE

Perform a complete communications check to ensure that all radios are operational.

a. Prepare the aircraft for safe ground maintenance and proceed with the following instructions for modification.

NOTE

Items removed to gain access to work area shall be tagged for identification and protected from damage until reinstalled. Retain a U hardware of removed parts for reinstallation unless otherwise specified. Refer to TM 55-1520-210-23 for detailed parts or equipment removal and installation instructions, Refer to TM 55-1520-210-23P for detailed parts. Refer to TM 55-1500-323-25 for detailed aircraft electrical and electronic wiring installation practices.

(1) Extend Searchlight. Reenergize (set to OFF) searchlight circuit breaker.

(2) Open nose compartment access door, disconnect and remove battery and plate behind the battery.

(3) Underneath the aircraft, at FS32, remove the marker beacon antenna access plate. Loosen clamps securing cable RM920A behind inspection plate at FS32.

(4) Remove pilot's door assembly.

(5) Remove pilot's tail rotor control pedals and stems at base of stems.

(6) Remove the copilot's door assembly.

(7) In the aircraft cabin, accomplish the following:

(a) Remove access panel assembly from left (copilot's) side of pedestal.

(b) Remove aft blanking panels and control head panels in top of pedestal, sufficient to gain access to work area.

(c) Remove windshield center post cover.

(d) Open overhead left and right console panels.

b. Perform the following removal operations, if installed:

(1) At the nose compartment:

(a) Remove receiver R1388/ARM-82.

(b) Remove receiver/transmitter RT-348/ARC54 (or RT-823/ARC-131, if installed).

(c) Remove receiver/transmitter RT-742/ARC51BX.

(d) Remove marker beacon receiver R1041/ARN.

(e) Remove RPM limit warning detector.

(f) Remove MD-1 vertical gyro.

(g) Remove cable clamps and lacing from R1041/ARN wire bundle between connectors P501 and J506. Disconnect P506 from J506.

(h) Cut wire RM916A20 from P501.

(i) Disconnect wire RM900A20N from ground stud located on vertical support between AN/ARN-82 mount and battery.

(j) Remove J506 from mounting bracket and remove following wires from connector J506.

NOTE

Loosen pitot static manifold by removing end bolts to gain access to J506. Do not remove lines.

Wire Number	Connection
RM902B20	N
RM901A20	P
RM907A20	S
RM908A20	T
RM918A20	M

(k) Discard connector P501 and all attached wires.

(l) Remove cable clamps and lacing from P506 wire bundle.

(m) Remove following wires from P506.

Wire Number	Connection
RM918B20	M
RM902A20	N
RM901C20	R
RM907B20	S
RM908B20	T
RM901B20	P

(n) Disconnect marker beacon antenna cable RM920A from marker beacon antenna by reaching down through aft end of pedestal.

(o) Loosen cable clamps securing coaxial cable RM920A at aft wall of nose compartment and floor opening (FS21). Cut off connector P503 and pull cable through loosened clamps and discard.

(2) Inside the cabin:

(a) Remove indicator, ID-1347/ARN-82, from instrument panel. Save attaching hardware for reinstallation.

(b) Remove indicator, ID-998/ASN from instrument panel. Save attaching hardware for reinstallation.

(c) Remove turn and slip indicator from instrument panel. Save attaching hardware for reinstallation.

(d) Remove control, C-6873/ARN-82 from pedestal.

(e) Remove wire RM916A20 from pin 3, TB26. Remove wire from wire bundle and discard.

(f) At DC circuit breaker panel, disconnect wire, RM918A20 from R-1041 circuit breaker. Pull wire from windshield center post bundle and discard. Remove screw securing R-1041 circuit breaker to DC bus bar.

(g) Remove R-1041 placard and circuit breaker,

(3) At pilot's instrument panel:

(a) Cut wire RM908B20 from marker beacon indicator lamp. Pull wire from bundle and discard.

(b) Cut wires RM919A20N and RM918C20 as close as possible to indicator lamp. Remove indicator lamp from instrument panel. Retain for reinstallation.

(c) Remove wire RM907B20 from marker beacon HI-LO sensing switch. Discard wire.

(d) Disconnect wire RM917A20N from HI-LO sense switch. Remove switch from instrument panel. Retain for reinstallation.

(e) Cut and discard following wires at marker beacon ON-OFF/VOLUME switch: RM901B20, RM902A20, RM918B20, RM901C20, RM918C20, and RM917B20N. Disconnect wire RM917B20N from ground stud. Discard wire.

(f) Remove ON-OFF/VOLUME switch from instrument panel. Retain for reinstallation.

(g) Remove two cable clamps and ground wire from plug end of RPM warning wire harness.

c. Installation of Mounting Bracket Assembly.

NOTE

Due to differences between aircraft of the same model and series, the doubler plate (1560-UH1-781) and/or mounting bracket (1560-UH1-786) may have to be trimmed prior to final installation. Extent of trimming is determined by variations in existing rivet patterns.

(1) Determine locations of doubler plate rivet holes as follows (figs. 1 and 2).

(a) Remove first two rivets above right lower windshield support frame in rivet row at FS12 (fig. 2, view B).

(b) Position doubler plate along upper edge of windshield support frame (WL34) with aft edge overlapping rivet row at FS12, maintaining minimum edge distance of two rivet shank diameters.

(c) Mark rivet hole locations on doubler plate from inside aircraft through holes where rivets were removed. Remove doubler plate and drill holes as marked, using No. 30 drill (0.128 inch diameter). Replace doubler plate and cleco in place.

(2) Prepare mounting bracket (1560-UH1-786), crossbrace (1580-UH1-780) and crossbrace extension (1560-UH1-791) for installation as follows (fig. 1).

(a) Prior to installation in aircraft, ream pilot holes in crossbrace and mounting bracket to No. 40 (0.098 inch diameter) and clamp crossbrace to mounting bracket by installing cleco fastener. Align crossbrace at right angle to mounting bracket. Using predrilled holes in crossbrace as a guide, drill three No. 30 (0.128 inch diameter) holes and install two additional cleco fasteners (fig. 2, view E).

NOTE

Ensure correct mating of crossbrace to mounting bracket by referring to figure 1. Flanged end of crossbrace faces inboard. Vertical side of mounting bracket faces outboard.

(b) Position inboard flanges of mounting bracket and crossbrace against right wall (BL10) of nose compartment. Align notch on inboard edge of mounting base with flange on nose compartment wall at FS1. Align notch on top outboard edge of mounting bracket with flange on curved rib around aircraft nose at WL34. Check to determine whether any rivets in curved rib require removal.

(c) Determine which rivets must be removed from nose compartment wall at WL22, to permit installation of mounting bracket. Mark rivets to be removed. Mark location for installation of additional rivets for total of at least five rivets along flange of mounting bracket. See figure 2, view A, for suggested rivet pattern.

NOTE

If existing rivets are located less than two rivet shank diameters from ends of mounting bracket flange, do not remove rivets. Trim mounting bracket to clear rivets.

(d) Remove mounting bracket. Remove previously marked rivets along WL22. If necessary, trim ends of mounting bracket flange.

(e) Reinstall mounting bracket and crossbrace. Clamp in place at inboard flange of crossbrace and upper and inboard flanges of mounting bracket.

NOTE

To correctly align holes in bottom inboard flange of mounting bracket, extension drills (12 inch length) are required.

(f) Using existing pilot holes in mounting bracket, drill No. 40 (0.0937 inch diameter) holes through nose compartment wall at WL22 and curved rib (WL34). Install cleco fasteners (fig. 2, view F).

(g) At nose compartment wall (BL10) drill four No. 40 (0.0937 inch diameter) holes, using existing pilot holes in inboard flange of crossbrace as a guide. Install cleco fasteners.

(h) Position crossbrace extension (1560-UH1-791) against outer skin of aircraft and clamp to crossbrace (fig. 1). Using six existing pilot holes in crossbrace, mark crossbrace extension for drilling in a later step.

(i) Using three existing pilot holes in outboard end of crossbrace extension, drill three No. 40 (0.0937 inch diameter) holes through aircraft skin and doubler plate.

(j) Using soft lead pencil, trace outline of forward 2 inches of mounting bracket flange at approximately WL22 on nose compartment wall. Trace outline of forward section of upper flange of mounting bracket on curved rib (WL34). These outlined areas will be treated for electrical bonding in a later step.

(k) Remove mounting bracket and crossbrace from aircraft. Using existing pilot holes in crossbrace, drill six No. 30 (0.128 inch diameter) holes through crossbrace extension. Install six rivets (MS20470AD4-4) to secure crossbrace extension to crossbrace (fig. 2, view C). Also install three rivets (MS20470AD4-4) to secure crossbrace to mounting bracket (fig. 2, view E).

(3) Install doubler plate as follows:

(a) Mark upper edge of doubler plate for trimming by maintaining minimum edge distance from upper holes in doubler plate.

(b) Determine the location of additional rivets to secure doubler plate properly to aircraft and mark on doubler plate. Drill additional No. 30 (0.128 inch diameter) rivet holes through doubler plate and aircraft skin (fig. 2, view B).

NOTE

If an additional row of rivets cannot be installed foward of the three cross brace extension rivets, mark forward edge of doubler plate for trimming.

(c) Remove doubler plate. Trim if necessary. Clean off all burrs and chips. Position doubler plate on aircraft and install rivets (MS20470AD4-4) along aft side (FS12). Install rivets (MS20470AD4-3) in remaining holes, except three holes for crossbrace extension. These rivets will be installed in a later step.

(4) Prepare areas on nose compartment wall (BL10), curved rib frame assembly (WL34), and mounting bracket at approximately WL22 for bonding as follows:

(a) Within areas outlined by pencil, remove all paint by sanding, then polish with crocus cloth using caution not to remove excessive metal.

(b) Apply a brush coating of MIL-C-5541 corrosion resistant coating to the prepared areas.

(c) Prepare mating surfaces on mounting bracket, following above procedure.

(5) Install mounting bracket assembly as follows:

(a) Prior to installation, remove all burrs and chips from areas where holes have been drilled.

(b) Remove two forward nut plates from right nose compartment wall, where RPM limit warning detector was mounted. The two aft nut plates will be used to secure cable clamps in a later step. Install four rivets (MS20426AD3-3) in forward holes. Leave center nut plate holes open.

(c) Position mounting bracket assembly in aircraft. Install cleco fasteners.

(d) Enlarge all previously drilled pilot holes, using No. 30 drill (0.128 inch diameter). Back drill two No. 30 (0.128 inch diameter) holes through existing rivet holes in nose compartment wall at WL22. Drill previously marked holes in inboard flange of mounting bracket at WL22. Clean burrs and

chips around all rivet holes. Install three rivets (MS20470AD4-5) through doubler plate and crossbrace extension. Install rivets (MS20470AD4-4) and (MS20470AD4-5) in all remaining holes (fig. 2, views A, D, and F).

(e) Seal with original finish those areas prepared for electrical bonding.

(f) Seal outer edge of doubler plate with MIL-S-8802D sealing compound,

(6) Install mount (MT-4835/ARN) on mounting bracket with 16 screws (MS51958-64), 16 washers (MS15795-808) and 16 nuts (MS21044-C3) (fig. 10). Insure that retaining clamp is positioned toward aft end of mounting bracket.

d Perform following installations:

(1) Install marker beacon cable assembly (1560-UH1-789-2) between pilot's instrument panel and connector P506 as follows (figs. 4 and 6).

NOTE

The end of cable with solder sleeves installed goes to P506.

(a) Install contacts (MS24254-20P) on following wires and insert in connector P506 as indicated :

Wire Number	Connection
R1963-21B22	S
R1963-23B22	T
R1963-25F22	M
R1963-28B22	P
R1963-29B22	C
R1963-30A22	R
R1963-32A22	G

(b) Install contact (MS24254-20P) on end of ground wire R1963-34C22 and insert as pin N in connector P506.

(c) Route wire bundle aft and outboard to rear of pilot's instrument panel to marker beacon on/off switch following existing wire bundle. Tie wires temporarily to existing bundle. Position wire bundle to allow clearance for installation of indicator ID-1347C/ARN-82.

(d) Remove solder from all terminals on marker beacon ON-OFF/VOLUME switch, and indicator lamp.

(e) At end of cable without solder sleeves, prepare shield grounds of two shielded pairs for connection to aircraft ground. Use a 3-inch length of #20AWG wire for daisy chaining shield grounds (fig. 6, detail A). Use a 12-inch length of #20AWG (R1963-34F20N) wire on one end of daisy chain for connection to aircraft ground in a later step. See figure 3 for procedures on installation of solder sleeves (D-142-52).

(f) On following wires, install approximately 3/4 inch of heat shrink tubing (RNF-100, type 1) over each of the 5 wires and solder to marker beacon ON-OFF/VOLUME switch (figs. 6 and 7).

Wire Number	Terminal
R1963-28B22	3
R1963-29B22	5
R1963-32A22	5
R1963-30A22	4
R1963-23B22	2

(g) Solder wire R1963-23C22 to terminal 1 of ON-OFF/VOLUME switch, using 3/4 inch of heat shrink tubing. Cut wire to an approximate 4-inch length, install 3/4 inch of heat shrink tubing and solder other end to terminal 1 of the marker beacon indicator lamp.

(h) Install 3/4 inch of heat shrink tubing over each of the wires listed below and solder to indicator lamp as follows:

Wire Number	Terminal
R1963-25F22	2
RM919A20N	

(i) Install terminal lug MS25036-102 on wire R1963-21B22 and connect to ON terminal of HI-LO SENS switch.

(j) Connect wire (RM917A20N) to OFF terminal of HI-LO SENS switch.

(k) Position cable assembly at rear of instrument panel. Reinstall ON-OFF/VOLUME switch, indicator lamp, and HI-LO SENS switch on instrument panel in original locations.

(1) Install terminal lug MS25036-103 on ground wire R1963-34F22N attached to jumper wire of shielded pairs. Connect to ground stud located between course indicator ID-1347C/ARN-82 and turn and slip indicator at rear of instrument panel.

(m) Install spiral wrap tubing (LP390) on marker beacon wire bundle at rear of indicator (ID-1347C/ARN-82 and turn and slip indicator. Secure wire bundle to existing bundle using existing clamp located between ID-1347C/ARN-82 and turn and slip indicator.

(2) Install R1963/ARN receiver cable assembly (1560-UH1-789-1) as follows (fig. 4).

(a) Position connector P1 end of cable assembly, by installing clamps (MS21919DG7) and (MS21919DG8) on right wall of nose compartment at FS6, WL23. Use existing holes and nut plates from RPM limit warning detector installation, if possible. Install first clamp approximately 9 inches from connector P1 (fig. 5, details A thru E).

(b) Route cable assembly up nose compartment wall (BL10) to existing wire bundle (RPM limit warning detector) to aft wall of nose compartment and inboard. Follow existing bundle to point where wires break out. Break-out should be located within a few inches of junction with main wire bundle (BL0) running vertically.

(c) At break-out point in cable assembly, locate wire R1963-22A20N and route along existing wire bundle to TB1. Install terminal lug MS25036-103 and connect wire R1963-22A20N to ground stud adjacent to TB1.

(d) Further separate wire bundle into four individual branches (control C-6873/ARN-82, relays K-53 and K-54, connector J506, and DC circuit breaker panel). Route individual branches as follows:

1. Route C-6873/ARN-82 branch inboard to junction with main wire bundle (BLO). Follow main wire bundle downward and aft through opening in front of pedestal and route directly to C-6873/ARN-82 control connector P311. Tie temporarily to existing bundle. Cut following wires to length, install contacts (MS24255-20S) and insert in connector P311 as indicated.

Wire Number	Connection
R1963-20A20	T
R196303A22	N
R1963-4A22	s
R1963-5A22	t
R1963-6A22	q
R1963-7A22	i
R1963-8A22	j
R1963-9A22	k

Wire Number	Connection
R1963-10A22	m
R1963-11A22	n
R1963-12A22	r
R1963-13A22	K
R1963-18A22	J

2. Remove pin L and wire RN5293A22 from connector P311. Cut contact crimp socket from wire RN5293A22. Cut a 3-inch piece of #22 wire. Install a contact crimp socket (MS24255-20S) on one end of the 3-inch wire. Splice the 3-inch wire to wires R1963-19A22 and RN5293A22 using splice, conductor (solder sleeve) (D142-50). Reinstall pin L in P311 (fig. 6).

NOTE

If heat gun is not available, refer to TM 55-1500-323-25 for alternate methods of splicing and shield termination.

3. Route wire R1963-32B22 along existing wire bundle to TB26. Cut wire to length, install terminal lug MS25036-102 and connect to pin 3, TB26.

4. Route K-53/K-54 relay branch inboard to junction with main wire bundle (BLO). Follow main wire bundle, routing wires through existing clamps, down to point where RT-348/ARC-54 or RT-823/ARC-131 wire bundle breaks out. Follow RT-348 or RT-823 wire bundle to relays K-53/K-54. Relays are located at aft end of lower right equipment shelf of nose compartment. Remove relays from mounting bracket for ease of work. Cut wires to length and install approximately 3/4 inch of heat shrink tubing (RNF-100, type I) over each wire.

NOTE

Due to variations in existing wiring connections to relays K-53/K-54, individual contacts will not be specified for installation of new wires. See figure 7 for identification of corresponding contacts for existing and new wires. These connections will provide continuity between connectors P1 and P1601 when the relays are in the deenergized position.

5. Locate existing wire RF446B22 on relay K-53. Solder wire R1963-14A22 to vacant contact corresponding to wire RF446B22.

6. Locate existing wire RF413B22 on relay K-53. Solder wire R1963-15A22 to vacant contact corresponding to wire RF431B22.

7. Locate existing wire RF448C22 on relay K-54. Solder wire R1963-16A22 to vacant contact corresponding to wire RF448C22.

8. Locate existing wire RF447C22 on relay K-54. Solder wire R1963-17A22 to vacant corresponding contact of wire RF447C22. Reinstall relays K-53/K-54 in mounting bracket.

9. Route J506 branch inboard to junction with main wire bundle. Follow existing wire bundle upward to connector J506. Cut wires to length. At J506 prepare shield ground of shielded pair R1963-28A22/R1963-29A22 for connection to ground wire by installing solder sleeve (D142-52). Use a 6-inch length of #22AWG wire (R1963-34B22) for ground lead. Install contact (MS24255-20S) on ground wire and insert in connection N of J506.

10. Install contacts (MS24255-20S) on following wires and insert in connector J506 as indicated.

Wire Number	Connection
R1963-32B22	G
R1963-21A22	S
R1963-23A22	T
R1963-25E22	M
R1963-29A22	C
R1963-28A22	P

11. Reinstall connector J506 on mounting bracket.

12. Route DC circuit breaker branch inboard to junction with main wire bundle. Follow main wire bundle upward along windshield center post to DC circuit breaker panel. Route wires through existing cable clamps. Connect wire R1963-20A20 to either terminal of R1963 circuit breaker (MS26574-1) using terminal lug MS25036-102. Connect wire R1963-20B20 to other terminal of R1963 circuit breaker using terminal lug MS25036-102. Install circuit breaker and R1963 placard (1560-UH1-792-2) at location shown in figure 8. Install blank placard (1560-UH1-792-4) in place of original R1041 placard.

NOTE

Circuit breaker is not connected to DC bus bar. Do not install circuit breaker in location covered by DC bus bar.

13. On aft wall of nose compartment, at point where wire bundle turns inboard (BL9), secure R1963 cable assembly to existing wire bundle by replacing existing clamp with clamp (MS21919DG16). Install new clamp using existing hardware (fig. 5, detail F).

14. On aft wall of nose compartment, at point where K-53/K-54 and C-6873\ARN-82 wire branches are routed downward (BLO), replace existing clamp with clamp MS21919DG26. (fig. 5, detail G).

(3) Install marker beacon antenna cable R1963-1A (1560-UH1-790) as follows:

(a) Mate connector P4 to connector J503 on marker beacon antenna. Route cable forward, through clamps previously securing RM920A MB coaxial cable. Route cable upward through floor opening (FS21, WL19) and continue forward to lightening hole (fig. 5) in nose compartment right wall. Route cable through lightening hole to termination point at mounting bracket.

(b) At FS38, FS24, and FS21, secure cable with existing clamps and hardware (fig. 4).

(c) On nose compartment wall, secure cable using clamp MS21919DG3 (fig. 5, detail H).

(d) Cut cable to length, approximately 8 inches from clamp installed in previous step. Slide marker bands P2 (1560-UH1-799) and R1963-1A (1560-UH1-795) over end of cable.

(e) Install connector P2 (UG88E/U) on cable.

(4) Install glideslope antenna assembly (1560-UH1-805) and antenna coaxial cable R1963-2A (1560-UH1-793) as follows (fig. 9).

(a) At left (copilot's) cabin nose window support frame (WL34), remove two existing screws (retain nuts for later reinstallation) located at BL21 and BL23. (Fifth and sixth screws from inboard edge of cabin nose window support frame) (fig. 9).

(b) Position antenna assembly inside aircraft at left cabin nose window (fig. 9). Align predrilled hole in antenna bracket (1560-UH1-804) with outboard hole (BL23) prepared in step (a) above.

NOTE

Ensure that antenna is positioned horizontally with Velcro pile against nose window.

(c) Using inboard hole (BL21) as a guide, drill a 0.25 inch diameter hole through fiberglass bracket.

(d) Install 2 screws (AN525D10R10), 2 washers (NW10-4373), 2 washers (AN960PD10L), and 2 nuts (existing).

(e) Inside aircraft at right side of nose compartment, route antenna cable R1963-2A through lightening hole, following marker beacon antenna cable R1963-1A.

(f) Secure cable R1963-2A to same location on nose compartment wall as marker beacon cable by installing additional clamp MS21919DG3 (fig. 5, detail H).

NOTE

Clamp cable R1963-2A approximately 7 inches from connector P3 to allow for mating with receiver R1963/ARN, when installed.

(g) Route cable aft following existing AN/ARC-54 coaxial cables to aft edge of nose compartment wall (FS22). Further route cable inboard, following existing wire bundle across centerline of aircraft through existing clamps, to nose compartment left wall. Route cable forward following existing RT-742/ARG51BX antenna coaxial cable. Tie temporarily to existing wire bundles.

(h) At forward edge of nose compartment, route cable upward along nose compartment left wall to lightening hole (WL32). Insert cable through lightening hole and route beneath curved rib frame assembly (WL34) to glideslope antenna connector 1J1.

(i) Cut cable to length and slide marker band 1P1 (1580-UH1-797) and R1963-2A (1560-UH1-794) over end of cable.

(j) Install connector 1P1 (UG88E/U) on cable and connect to 1J1.

(k) Install clamps as shown in figure 5, detail I through N. Remove existing screw located at LBL19 (4th screw from inboard edge of copilot's cabin nose window support frame) and install MS21919DG3 as shown in figure 5, detail N.

(5) Reinstall RPM limit warning detector on mounting bracket at location shown in figure 10. Using predrilled holes in mounting bracket, install 4 screws (MS51958-64), 4 washers (MS15795-808), and 4 nuts (MS21044C3).

(6) Position receiver R1963\ARN on the mount with connectors facing aft. Place the retaining clamp over the lip on the front of the receiver and tighten the thumbscrew.

(7) Reinstall R1388()/ARN-82 receiver in aircraft. Determine whether receiver is an R-1388 or R-1388A model and note.

(8) Install indicator ID-1347C/ARN-82 on instrument panel with 4 screws (MS35214-28) and 4 nuts (NAS487-15). Use existing hardware.

NOTE

The ZERO SWITCH, which is accessible by removing cover plate on the rear of the ID-1347C/ARN-82, must be set to match the receiver model. Read label on switch cover to determine if indicator is ZEROED for R-1388 or R-1388A model receiver. If indicator is not ZEROED for receiver model installed in aircraft, remove switch cover, place switch in opposite position and reinstall switch cover 80 proper label is facing outward.

(9) Install control C-6873B/ARN-82 in pedestal.

(10) Attach R1963/ARN decal (1560-UH1-792-1) to aft bottom flange of mounting bracket at location shown in figure 10. Attach RPM warning control decal (1560-UH1-792-3) to outboard side of mounting bracket at location shown in figure 10.

(11) Mate connector P506 to J506.

e. Complete modification as follows:

(1) Perform the following functional test:

(a) Using mltimeter TS-352B/U or equivalent, make the following continuity checks:

From -	To-	Reading - (OHMS)
P1 Pin -27	Aircraft Ground	0
-11	P311Pin N	0
-29	s	0
-12	t	0
-30	q	0
-13	i	0
-31	j	0
-14	k	0
-32	m	0
-15	n	0
-33	r	0
-28	K	0
-10	J	0
-4	L	0
-5	T (with R1963 circuit breaker energized)	0
-16	P1601 Pin L	0
-34	M	0
-17	R	0
-35	S	0
-19	Aircraft Ground	0
-7	Marker Beacon ON-OFF/ Volume Control, Term 3	0
-8	Marker Beacon ON-OFF/ Volume Control, Term 5	0
-3, 20, 21	Marker Beacon Indicator Lamp, Term 2	0
-6	Marker Beacon ON-OFF/ Volume Control, Term 2	0
-1	Marker Beacon, HI-LO SENS switch center wiper	0
TB26, Term 3	Marker Beacon ON-OFF/ Volume Control, Term 5	0
TB20, Term 8	Marker Beacon ON-OFF/ Volume Control, Term 4	0
All contacts of P311	Shell of P311	Infinite
All contacts of P1	Shell of P1	Infinite

(b) Disconnect connector P4 from marker beacon antenna. Check continuity from center conductor of P4 to center conductor of P2. Check for open between center conductor and body of P4. Reconnect P4 to marker beacon antenna and P2 to J2 of R1963/ARN receiver.

(c) Disconnect connector 1P1 from glideslope antenna. Check continuity from center conductor of 1P1 to center conductor of P3. Check for open between center conductor and body of 1P1. Reconnect 1P1 to glideslope antenna and P3 to J3 of R1963/ARN receiver.

(d) Mate connector P1601 to J1601. Mate connector P311 to J311. Reinstall battery and place battery switch in ON position. Energize ARN-82 and R1963 circuit breakers, and turn on G6873B/ ARN-82 control.

(e) Using multimeter RS-352B/U or equivalent, verify that 28 VDC is present between connector PI pin 5 and pin 27 (ground). Turn off C-6873B/ARN-82 control and set ARN-82 and R1963 circuit breakers to OFF position. Place battery switch in OFF position.

(f) Mate connector P1 to J1 of R1963/ARN receiver.

(2) Perform a functional check of the R1963/ARN as follows:

NOTE

If system does not function as specified, check by substitution of components. If malfunction still exists, refer to the appropriate technical manual for substitution of interfacing components not part of this system.

(a) Insure that all connectors are connected at receiver R1963, control C-6873B/ARN-82, receiver R1388/ARN-82, indicator ID-1347C/ARN-82, and the VOR, MB, and GS antennas.

(b) Connect an auxiliary power source to the helicopter. Energize the AN/ARN-82, R1963 MB/GS, intercom, and COURSE IND circuit breakers. Energize main inverter.

(c) On the pilot's instrument panel, set the MB VOL control to mid-position. SENS switch to HI. On control C-6873B/ARN-82, set NAV VOL to mid-point.

NOTE

Signal generator SG-13/ARN and test oscillator BC-376 are required to perform the following checks. If Collins ramp test set 972Q-4 is available, refer to subparagraph (i) for procedures.

(d) Test setup.

1. With the SET LINE to 21V control OFF, connect the SG13/ARN to a 21 to 29 volt DC portable power source.

2. Set METER switch to LINE.

3. Rotate SET LINE to 21V control for 21V ± 0.5 volts indication on meter.

4. Allow at least 15 minutes warm-up.

5. Set the MEGACYCLES control to 109.30 (332.00 MHz), and set receiver frequency (in aircraft) to 109.30.

6. Set AUDIO SELECTOR switch to GLIDESLOPE.

7. Set NAV GS switch to GS.

8. Set MICROVOLTS control to 1K microvolt.

9. Set METER switch to CAR

10. Adjust CARRIER SET control for red-line indication on meter.

11. Set LOC-GS switch to DOWN.

12. Position the SG13/ARN 50 feet directly in front of the aircraft center and move towards the aircraft until the glideslope warning flag is driven out of view.

(e) Glideslope test procedure.

1. Set MICROVOLTS control to 10K microvolt.

2. Set LOC-GS control to center (white line).

3. The glideslope deviation indicator in the aircraft shall be within the center donut.

4. Set LOG-GS control to UP.

5. The glideslope deviation indicator in the aircraft shall deflect full scale upward.

6. Set LOC-GS control to DOWN.

7. The glideslope deviation indicator in the aircraft shall deflect full scale downward.

(f) VOR test procedure.

1. Set MEGACYCLES control to 114.90 MHz.

2. Set AUDIO SELECTOR switch to VOR.

3. Set MICROVOLTS control to 10K microvolt.

4. Set NAV GS switch to NAV.

5. Set receiver frequency (in aircraft) to 114.90 MHz.

6. Set VOR control to 0°.

7. Adjust the aircraft OBS control for zero deviation. The OBS dial shall indicate 0° ± 5.0°.

8. Set VOR control to each of its other positions and adjust the OBS control for zero at each position. The OBS dial shall indicate the same reading as the VOR control for each position (± 5.0°).

(g) Localizer test procedure.

1. Set MEGACYCLES control to 110.10 MHz.

2. Set AUDIO SELECTOR switch to TONE LOC.

3. Set MICROVOLTS control to 10K microvolt.

4. Set receiver frequency (in aircraft) to 110.10 MHz.

5. Set LOC-GS control to center (white line).

6. The LOC deviation indicator in the aircraft shall be within the center donut.

7. Set LOC-GS control to LEFT.

8. The LOC deviation indicator in the aircraft shall deflect to the left.

9. Set LOC-GS control to RIGHT.

10. The LOC deviation indicator in the aircraft shall deflect to the right.

(h) Marker beacon test procedure. Flight line tests of the marker beacon receiver are performed using the test oscillator BC-376. The BC-376, with its antenna fully extended, must be placed 10 to 20 feet from the marker beacon receiver antenna. A headset should be used to monitor the marker beacon audio output.

1. Turn the BC-376 on and move it toward the receiver antenna until a strong signal is heard in the headset.

2. Set the BC-376 MODULATION switch to 400. The marker lamp on the aircraft instrument panel must light.

3. Set the BC-376 MODULATION switch to 1300. The marker lamp on the aircraft instrument panel must light.

4. Set the BC-376 MODULATION switch to 3000. The marker lamp on the aircraft instrument panel must light.

(i) Alternate test procedure using Collins 972Q-4 VOR/ILS/MB Ramp Test Set.

NOTE

The test set should be positioned as near the center line of the aircraft as possible. The test set may be positioned either in front of or behind the aircraft to maintain line-of-sight between the test set and aircraft antennas.

(j) VOR operation.

1. Connect the 972Q-4 test set to the test set antennas.

2. Set the 972Q-4 for 30 dB of output attenuation. Adjust the 972Q-4 for a standard VOR signal at 108.00 MHz.

3. On control, C-6873B/ARN-82, set NAV VOL control fully clockwise and frequency selectore to 108.00 MHz.

4. With the test set approximately 20 feet from the aircraft VOR/LOC antenna, move the test set towards the aircraft VOR/LOC antenna until the VOR/LOC warning flag on the ID-1347C/ ARN-82 course deviation indicator goes out of view. Set the 972Q-4 for 7 dB output attenuation (remove 23 dB of attenuation).

5. Set 972Q-4 bearing selector for 0°, then rotate OBS knob on ID-1347C/ARN-82 to approximately 0° to center the VOR/LOC deviation needle within the center circle.

6. Set 972Q-4 bearing selector to 10°; the VOR/LOC deviation needle on ID-1347C/ARN-82 shall deflect right and situate between the third deviation dot and the center of the end line.

7. Set 972Q-4 bearing selector to 350°; the VOR/LOC deviation needle on ID-1347C/ARN-82 shall deflect to the left and situate between the third deviation dot and the center of the end line.

8. Connect headset into aircraft intercom system, then adjust the 972Q-4 for VOR modulation plus 1020 Hz tone modulation; this 1020 MHz tone shall be audible.

9. Adjust the 972Q-4 to remove the 30 Hz variable phase modulation; the VOR/LOC warning flag on the ID-1347C/ARN-82 shall come into view.

(k) LOC operation.

2. Adjust the 972Q-4 for a standard LOC centering signal at 108.10 MHz.

2. On control, receiver C-6873B/ARN-82, set NAV VOL control fully clockwise and frequency selectors to 108.10 MHz.

3. The VOR/LOC warning flagon the ID1347C/ARN-82 course deviation indicator shall be out of view.

4. With the 972Q-4 set for a standard LOC centering signal, the VOR/LOC deviation needle shall be within the center circle.

5. Adjust the 972Q-4 for a variable LOC deviation signal. Vary the LOC signal from 0 DDM to 0.155 DDM, 90 Hz predominating; the VOR/LOC deviation needle on the ID-1347C/ARN-82 shall deflect from center (at 0 DDM), then right to between the third deviation dot and the center of the end line (at 0.155 DDM) with no hang-ups.

6. Vary the LOC signal from 0 DDM to 0.155 DDM, 150 Hz predominating; the VOR/LOC deviation needle on the ID-1347C/ARN-82 shall deflect from center (at 0 DDM) then left to between the third deviation dot and the center of the end line (at 0.155 DDM) with no hang-ups.

7. Adjust the 972Q-4 to remove the 150 Hz modulation; the VOR/LOC warning flag on the ID1347C/ARN-82 shall come into view.

(1) Glideslope operation.

1. Set the 972Q-4 for 30 dB of output attenuation.

2. Adjust the 972Q-4 for a standard glideslope centering signal at 334.70 MHz.

3. On control, C-6873B/ARN-82, set NAV VOL control fully clockwise and frequency selectors to 108.10 MHz.

4. With the test set approximately 20 feet from the aircraft GS antenna, move the test set antenna towards the aircraft glideslope antenna until the glideslope warning flag on the ID1347C\ ARN-82 course deviation indicator goes out of view. Set the 972Q-4 for 7 dB of output attenuation (remove 23 dB of attenuation).

5. With the 972Q-4 set for a standard glideslope centering signal, the glideslope deviation needle on the ID-1347C/ARN-82 shall be within the center circle.

6. Adjust the 972Q-4 for variable glideslope deviation signal. Vary the glideslope deviation signal from 0 DDM to 0.175 DDM, 90 Hz predominating; the glideslope deviation needle on the ID-1347C/ARN-82 shall deflect from center (at 0 DDM) then down to between the third and fourth deviation dots (at 0.175 DDM) with no hang-ups.

7. Vary the glideslope deviation signal from 0 DDM to 0.175 DDM 150 Hz predominating; the glideslope deviation needle on the ID1347C/ARN-82 shall deflect from center (at 0 DDM) then up to between the third and fourth deviation dots (at 0.175 DDM) with no hang-ups.

8. Adjust the 972Q-4 to remove the 150 Hz modulation; the glideslope warning flag on the ID-1347C/ARN82 shall come into view.

(m) Marker beacon operation.

1. Connect a headset into aircraft intercom system.

2. On pilot's instrument panel, set the MB SENS switch to HI position and the MB VOL control fully clockwise.

3. With the 972Q-4 situated directly in front of the aircraft, set the 972Q-4 controls for an output signal of 75 MHz, modulated 95% by 400 Hz.

4. Move the 972Q-4 towards the aircraft until a strong audio tone is audible. The marker lamp on the aircraft instrument panel shall be illuminated.

5. Set tone modulation output of 972Q-4 to 1300 Hz. The marker lamp on the aircraft instrument panel shall be illuminated and 1300 Hz tone shall be audible.

6. Set tone modulation output of 972Q-4 to 3000 Hz. The marker lamp on the aircraft instrument panel shall be illuminated and 3000 Hz tone shall be audible.

(3) Inspect all wire bundles and remove all temporary ties. Lace and/or tie wire bundles in accordance with TM 55-1500-323-25. Secure bundles using existing cable clamps and existing holes where possible.

(4) Close or replace all access doors and plates opened or removed.

(5) Replace all components or assemblies removed for access.

(6) Perform a functional check of communications, navigation and electrical systems affected by this modification.

11. Calibration Requirements.

Not applicable.

12. Weight and Balance Data.

Weight and balance change as a result of this MWO is as follows:

a. Change in Basic Weight: +8.6 lbs.

b. Moment Arm 6.4 inches.

c. Change in Basic Moment: 55.0 inch-pounds.

d. Chart "A" Entries (DD Form 365A, Basic Weight Checklist).

Compartment	Item	Weight (lbs)	Arm (in)	Moment/100 (in-lbs)
A	Receiver, R1963/ARN	4.0	5	+0.2
A	Mount, MT-4835/ARN	0.9	5	+0.0
A	Antenna, Glideslope RGS 10-48	0.2	-3	+0.0
A	Support Bracket	1.3	5	+0.1
A	Wiring Harness	3.0	12	+0.3

e. Chart "A' Deletions.

Compartment	Item	Weight (lbs)	Arm (in)	Moment/100 (in-lbs)
A	Wiring, R-1041 RCVR	0.8	14	-0.1

f. Chart "C" Entry (DD Form 365C Basic Weight and Balance Record).

Description	Weight	Added (Weight Change) Arm (in.)	Moment/100
MWO 551520-210-30-45	8.6	6.4	0.55

13. Quality Assurance Requirements.

Inspection of completed MWO application for full compliance with the technical requirements of the instructions will be accomplished by qualified personnel in accordance with an approved prescribed inspection system. The inspection, in effect, will be determined on the basis of instructions issued at the site of work, i.e., ORG/INTERMEDIATE; Army depot; contractor; etc.

14. Recording and Reporting of the Modification.

a. Records and Reports Forms.

(1) DA Form 2407 (Maintenance Request), DA Form 2408-5 (Equipment Modification Record - Aircraft), DA Form 2408-13 (Aircraft Inspection and Maintenance Record), DA Form 2408-17 (Aircraft Inventory Record). Record the modification on DA Form 2408-5, DA Form 2408-13 and DA Form 2408-17 as indicated in TM 38-750.

(2) Reporting of MWO application will be accomplished as required by TM 38-750. After completing the DA Form 2407, mail the NMP Copy (Copy 2) to Commander, US Army Troop Support & Aviation Materiel Readiness Command (TSARCOM), ATTN: DRSTS-MDO(1), 4300 Goodfellow Boulevard, St. Louis, MO 63120. If the application is accomplished by field personnel under a negotiated MOU and requires reimbursement, mail the Control Copy (Copy 3) to Commander, US Army Depot System Command (DESCOM) ATTN: DRSDS-PA 17201. Procurement Request Order Number (PRON), Memorandum of Understanding (MOU) Number and fiscal station code will be annotated in Block 35. If application is accomplished by depot or contractor teams, Copy 3 will not be submitted to DESCOM and may be disposed of in accordance with TM 38-750.

b. Marking equipment. Not applicable.

c. Identification data. Not applicable.

15. Complete Product Improvement Proposal (PIP) Number.

The product improvement proposal number is 1-74-01-0842-G-S.

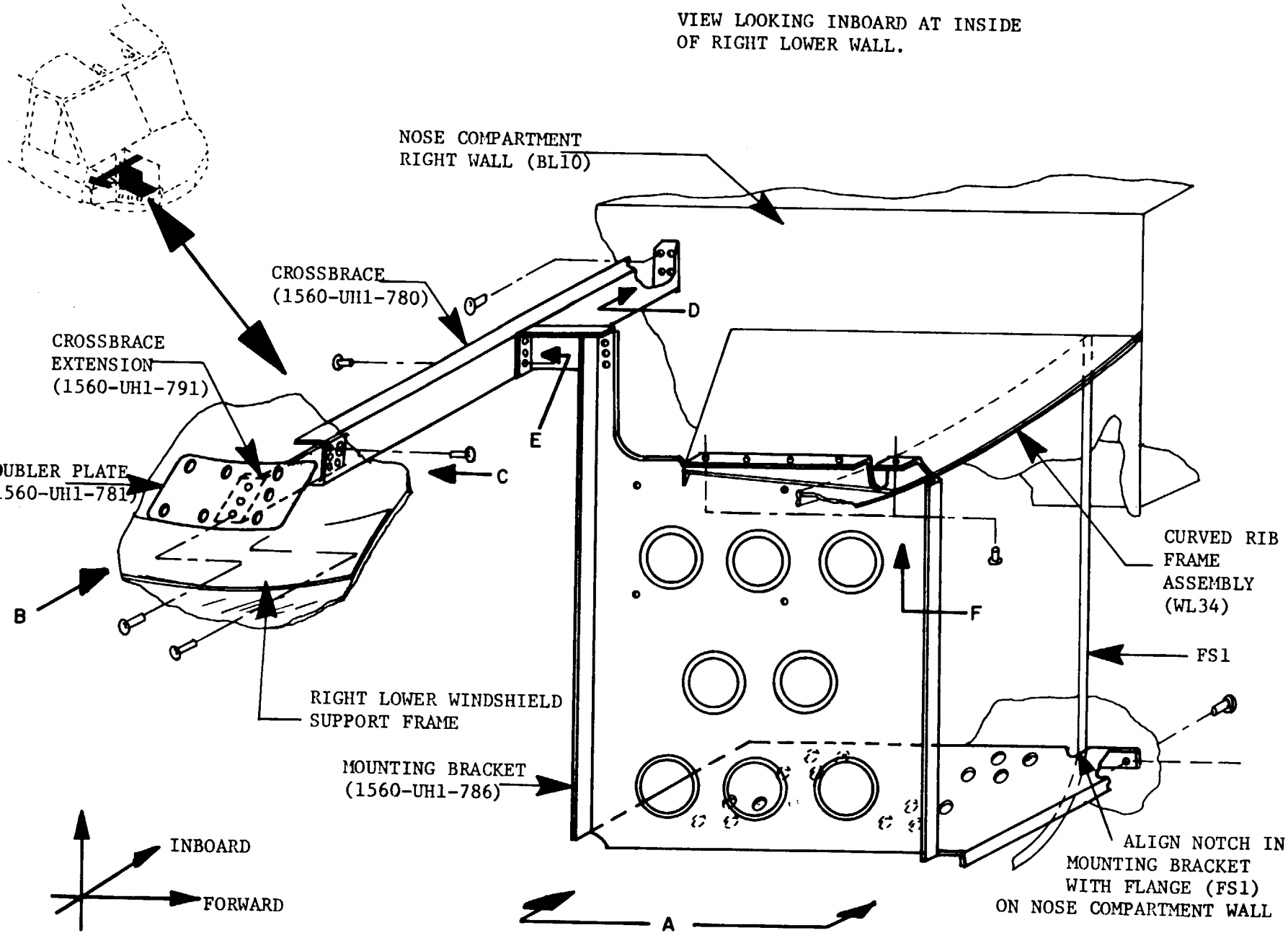


Figure 1. Installation of Mounting Bracket Assembly

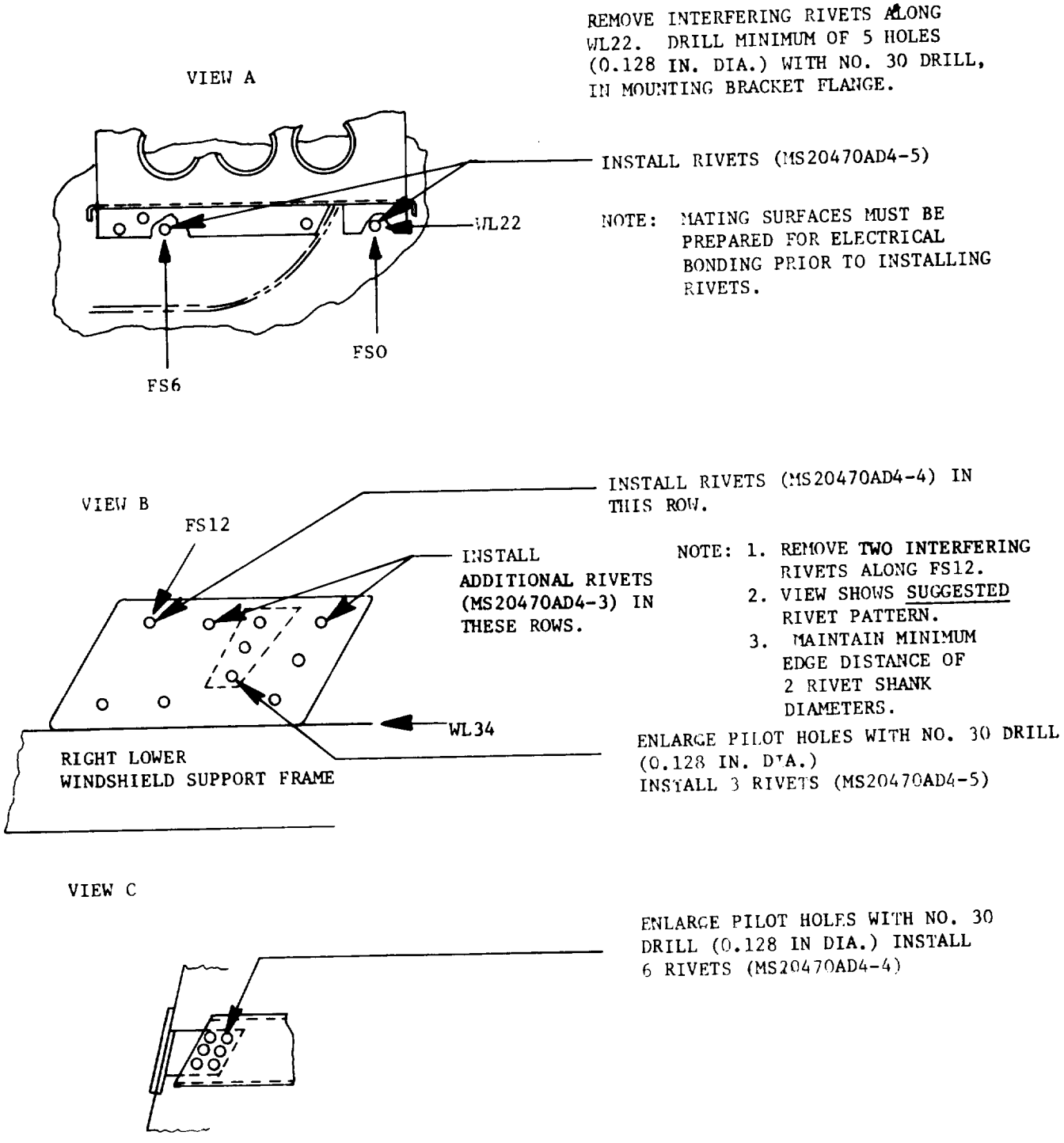
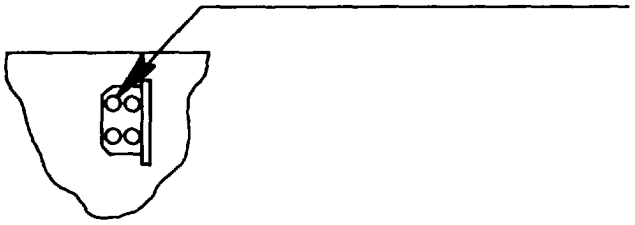


Figure 2. Rivet Pattern Views of Mounting Bracket Assembly (Sheet 1 of 2)

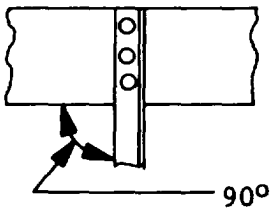
VIEW D

ENLARGE PILOT HOLES WITH NO. 30 DRILL (0.128 IN. DIA.). INSTALL 4 RIVETS (MS20470AD4-4)



VIEW E

ALIGN PILOT HOLES. POSITION CROSSBRACE AT RIGHT ANGLE (90°) TO MOUNTING BRACKET. DRILL 3 HOLES (0.128 IN. DIA.) WITH NO. 30 DRILL. INSTALL 3 RIVETS (MS20470AD4-4).



VIEW F

ENLARGE PILOT HOLES WITH NO. 30 DRILL (0.128 IN. DIA.). INSTALL 5 RIVETS (MS20470AD4-5)

NOTE: MATING SURFACES MUST BE PREPARED FOR ELECTRICAL BONDING PRIOR TO INSTALLING RIVETS.

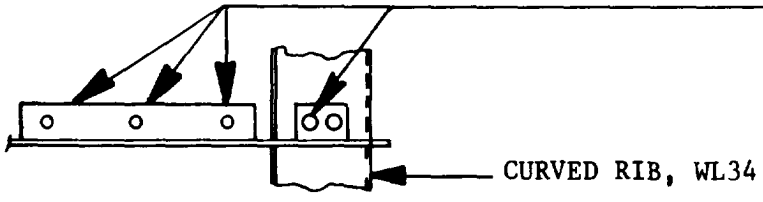
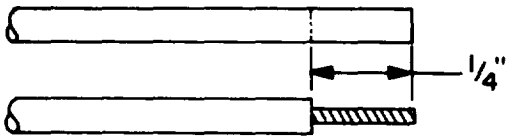
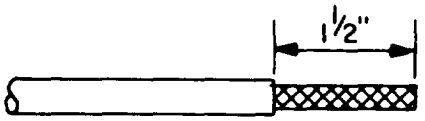


Figure 2. Rivet Pattern Views of Mounting Bracket Assembly (Sheet 2 of 2)



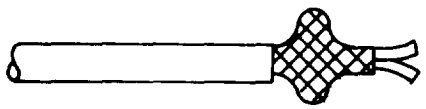
1. PREPARATION OF GROUND LEAD.

   STRIP INSULATION ¼" TO 5/16".

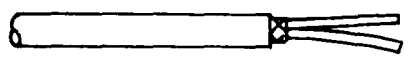


2. PREPARATION OF SHIELDED CABLE.

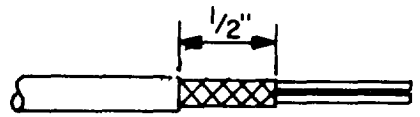
   a. SCORE AND REMOVE JACKET AS INDICATED.



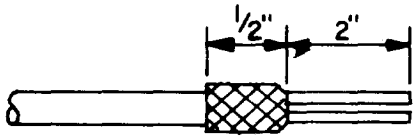
   b. BUNCH THE SHIELD.



   c. TRIM SHIELD BACK TO JACKET AS INDICATED.

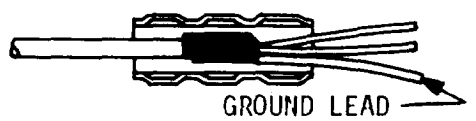


   d. SCORE AND REMOVE JACKET.



   e. FOLD SHIELD BACK.

3. ASSEMBLY.



   a. CENTER STRIPPED PORTION OF GROUND LEAD OVER STRIPPED PORTION OF THE SHIELD. PLACE THE WIRES IN THE SOLDER SLEEVE. CENTER THE STRIPPED PORTION BETWEEN THE MELTABLE INSERTS. THE STRIPPED PORTION OF BOTH CONDUCTOR AND CABLE SHOULD BE CENTERED IN THE SOLDER SLEEVE.

   b. USING A HOT-AIR GUN, HEAT THE SOLDER PREFORM FIRST UNTIL IT HAS MELTED AND FLOWED. THEN MOVE TO EACH END AND HEAT THE MELTABLE INSERT UNTIL THE MATERIAL FLOWS FREELY BETWEEN THE TUBING AND CABLE.

NOTE: HOT AIR TOOLS REQUIRE A HEAT UP TIME TO STABILIZE AND SHOULD BE LEFT ON WHERE PRACTICAL TO ELIMINATE WARM UP PERIOD AND TO MAINTAIN CORRECT APPLICATION TEMPERATURE.

Figure 3. Solder Sleeve Installation Procdures

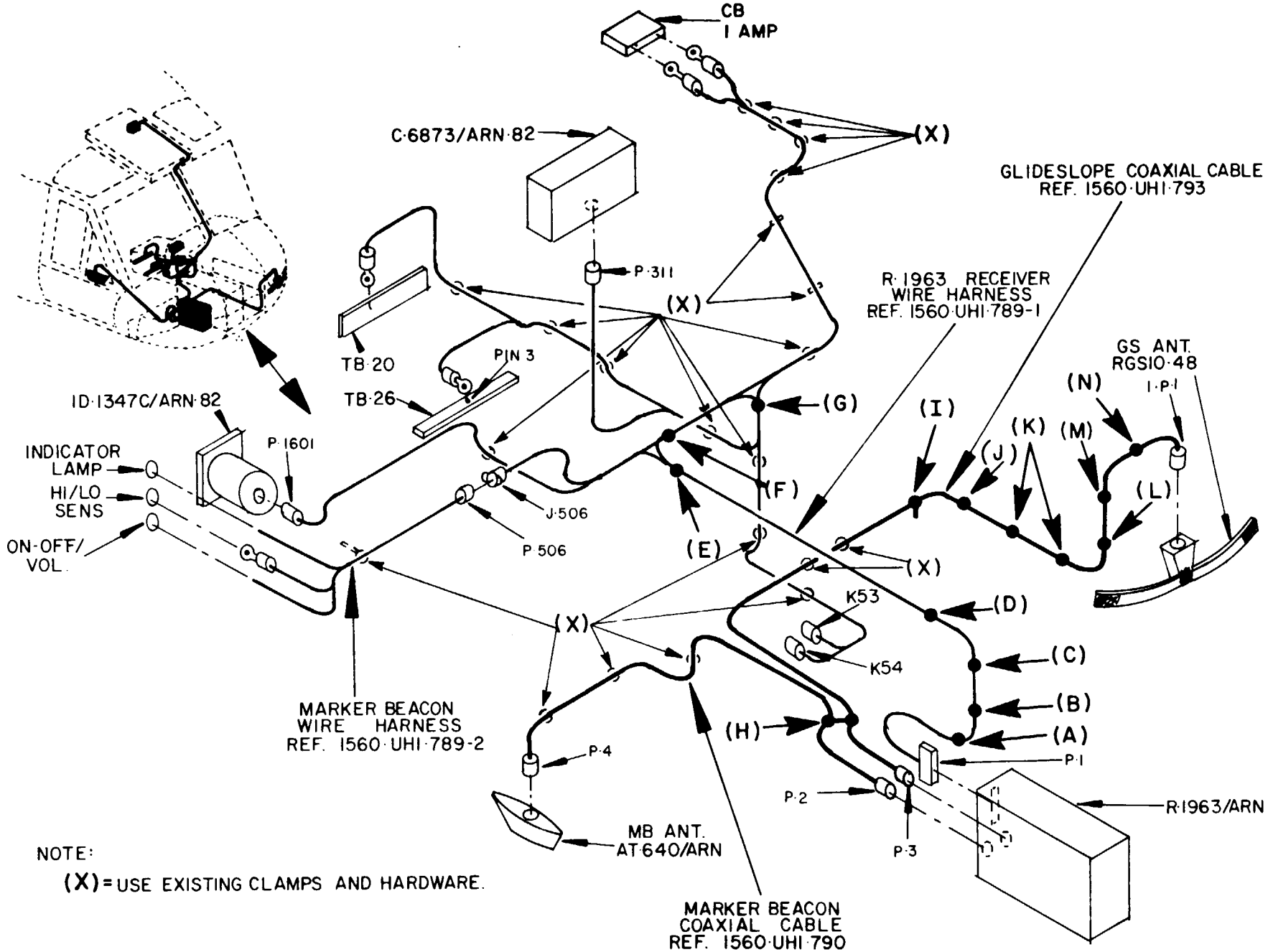


Figure 4. R1963/ARN Wiring Interface

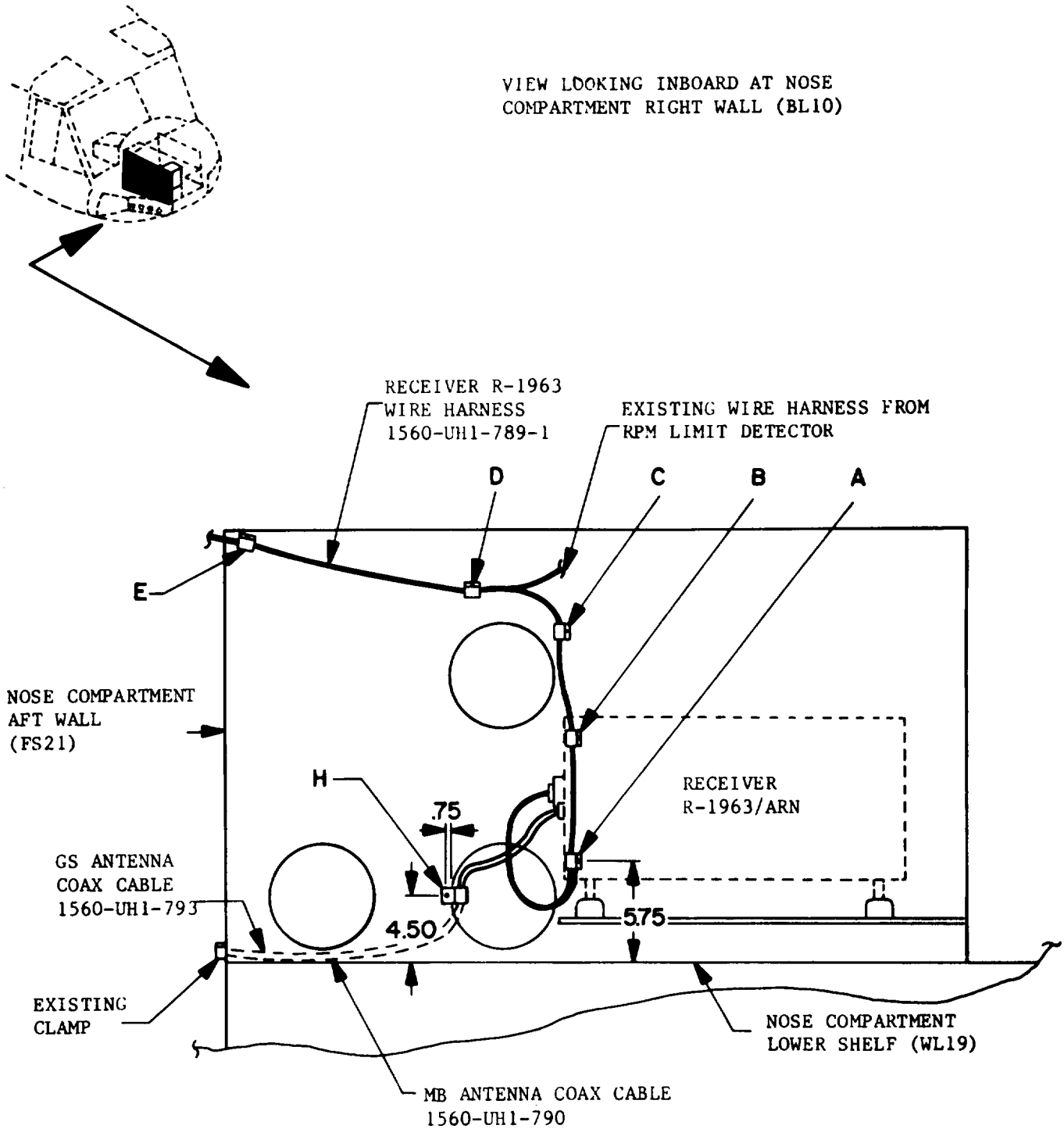


Figure 5. Cable Installation Detail (Sheet 1 of 5)

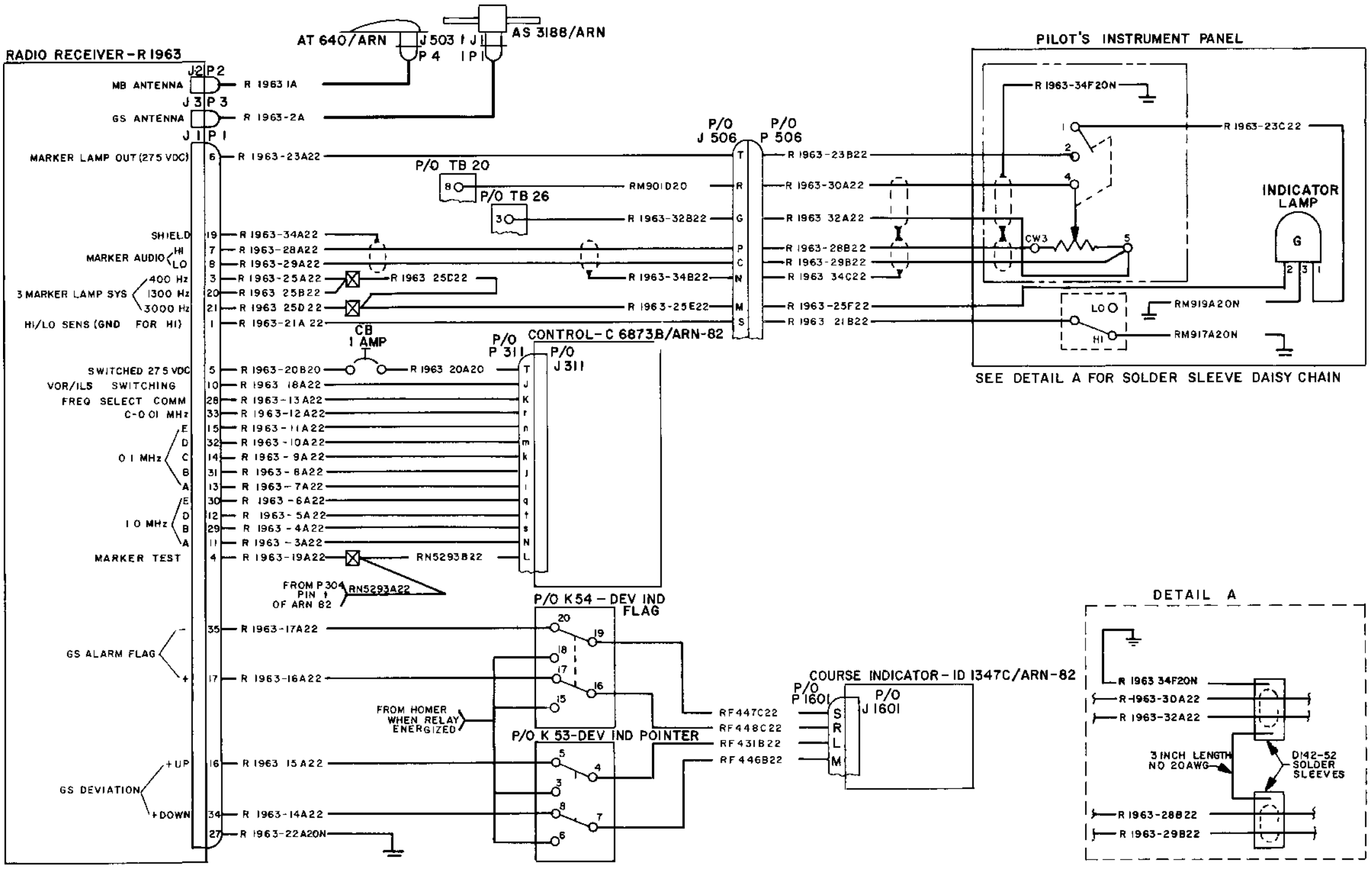
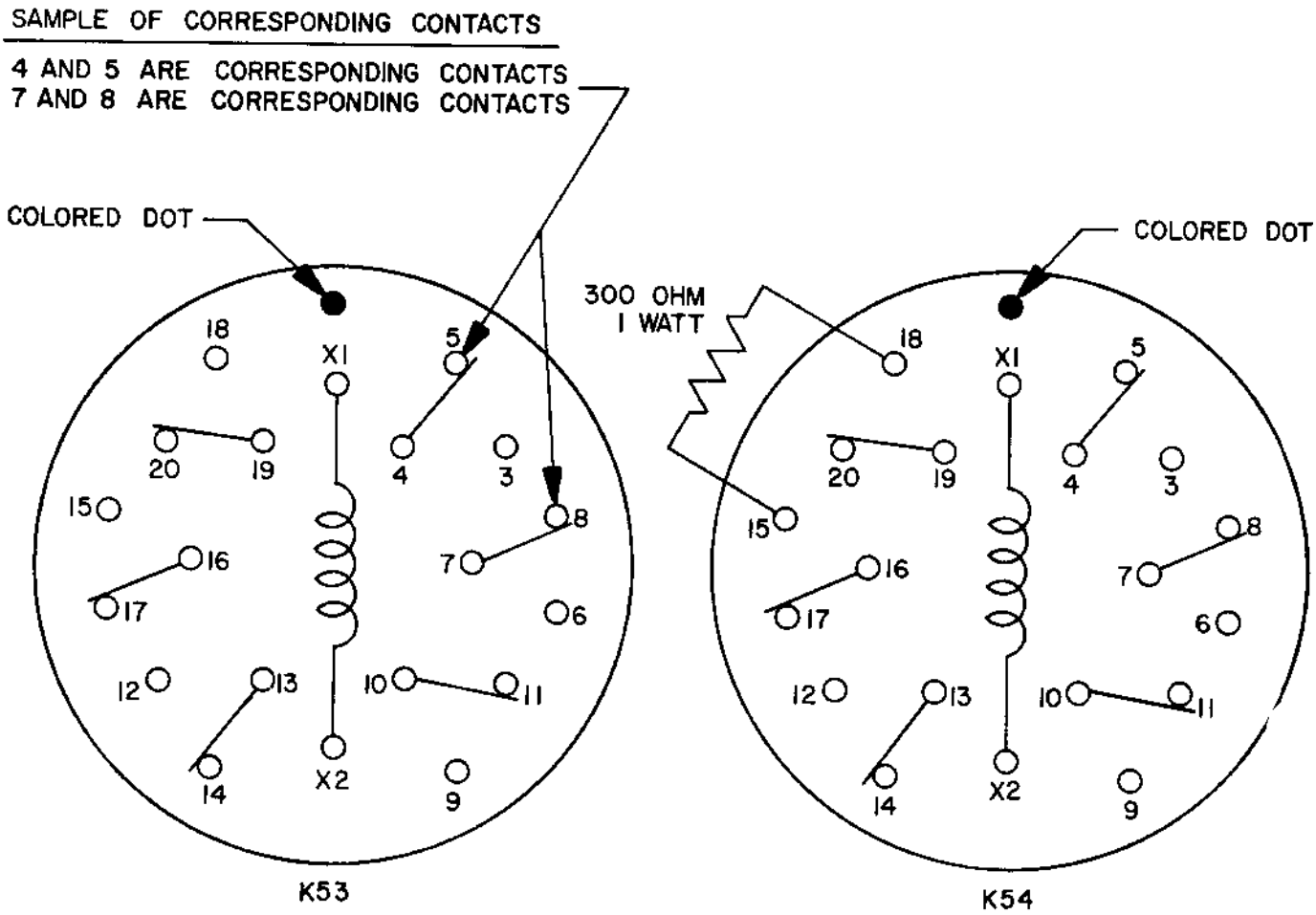


Figure 6. R1963/ARN Wiring Diagram



NOTES

1 RELAYS K53 AND K54 ARE IDENTICAL, EXCEPT FOR 300 OHM RESISTOR ON K54, ON SOME AIRCRAFT
2 RELAYS SHOWN IN DEENERGIZED POSITION
3 SOME AIRCRAFT MAY USE FOUR POLE RELAYS

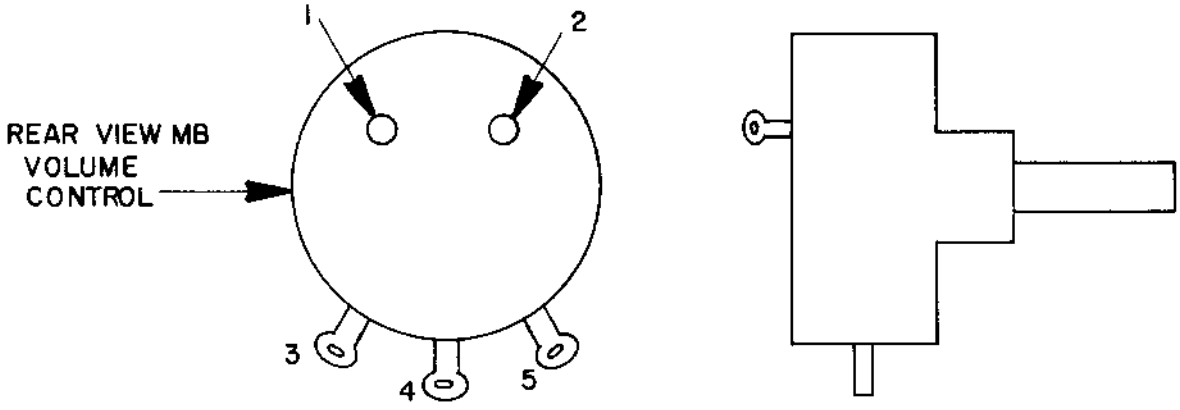
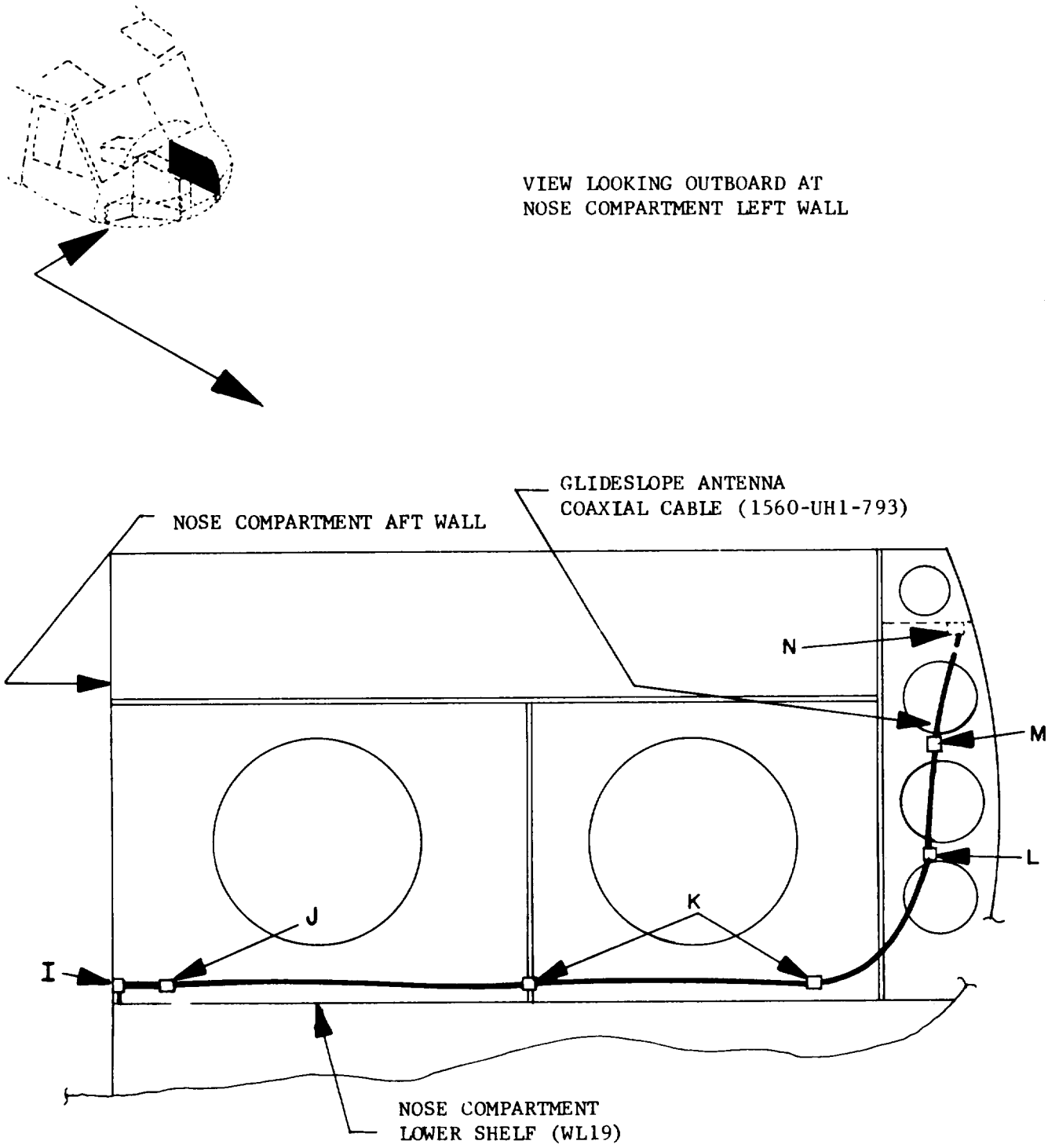


Figure 7. VOR/Homer Relays and MB Volume Control Outline Diagrams



NOTES: 1. Cable Clamp I located Inboard 5 inches from nose compartment left wall.

2. Cable clamp N located under curved rib frame assembly (WL34) at left BL16.

Figure 5. Cable Installation Detail (Sheet 2 of 5)

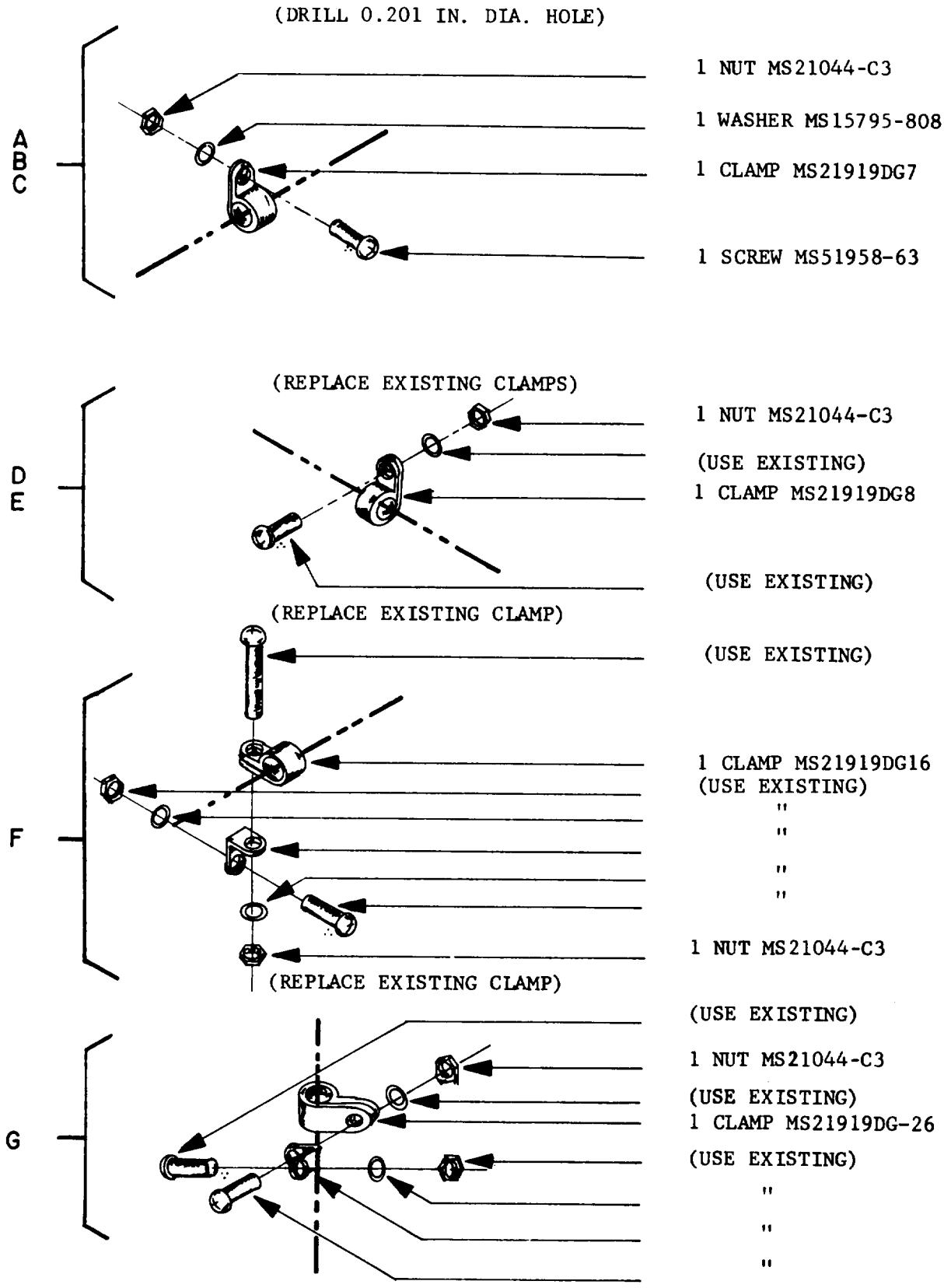


Figure 5. Cable Installation Detail (Sheet 3 of 5)

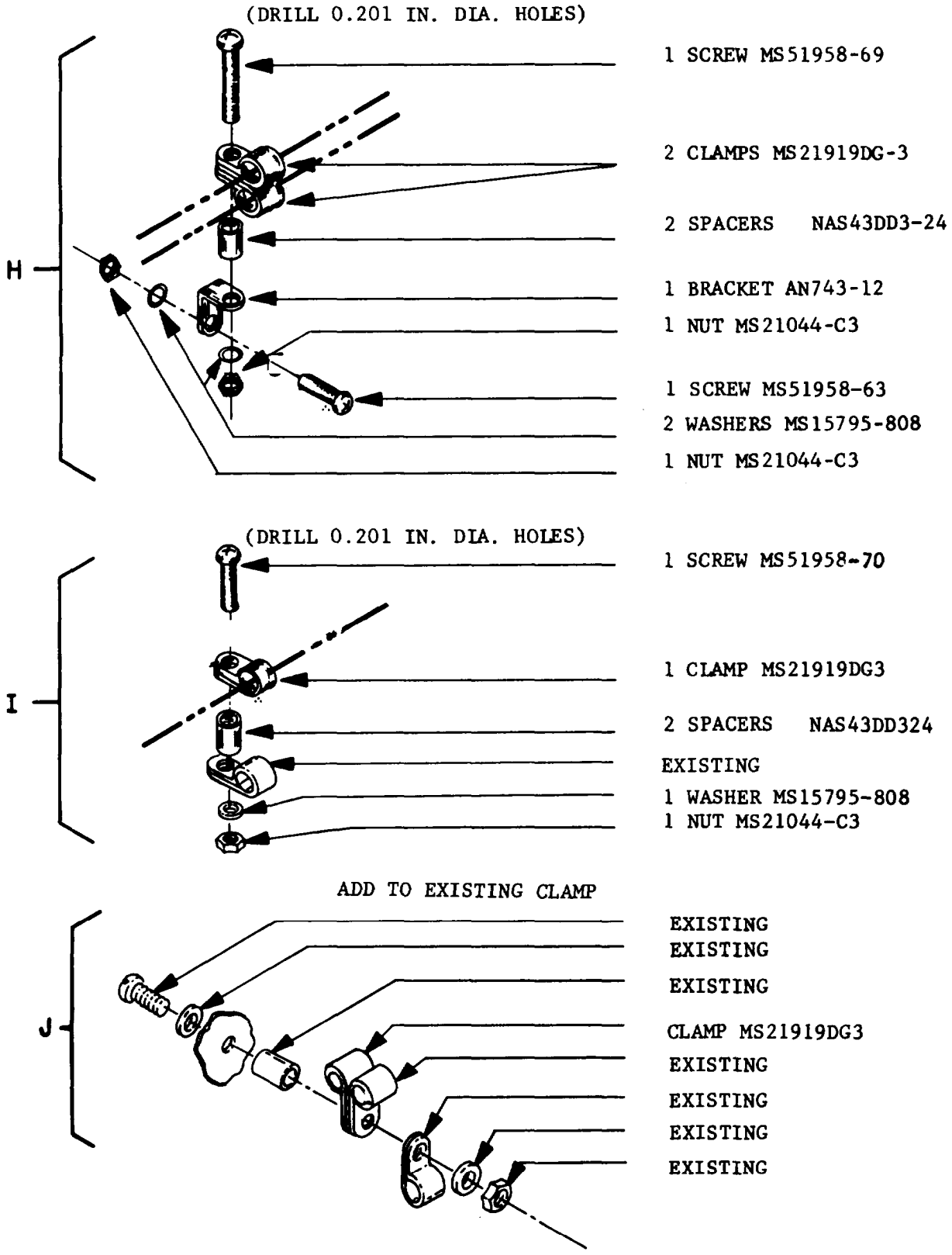


Figure 5. Cable Installation Detail (Sheet 4 of 5)

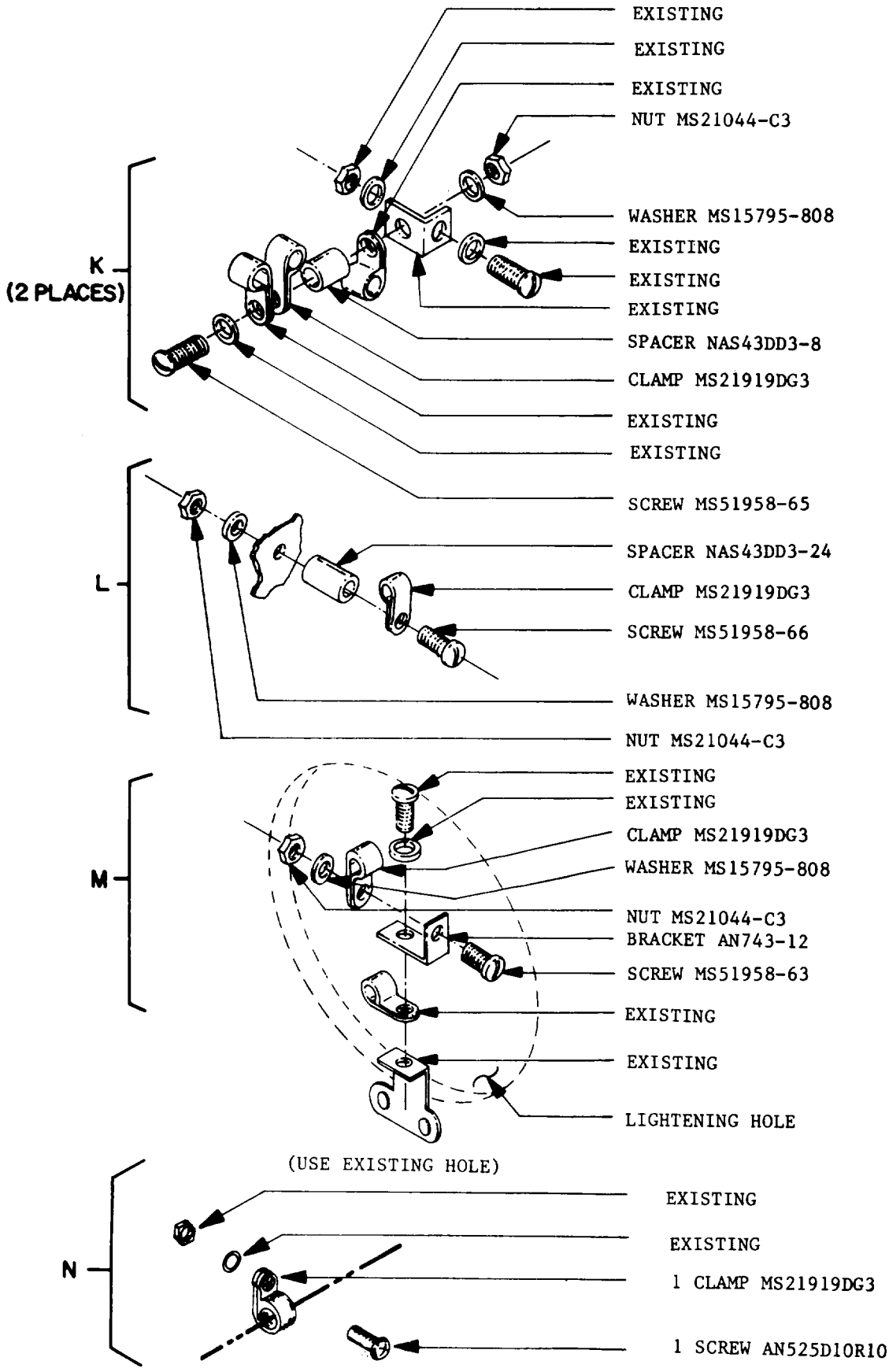


Figure 5. Cable Installation Detail (Sheet 5 of 5)

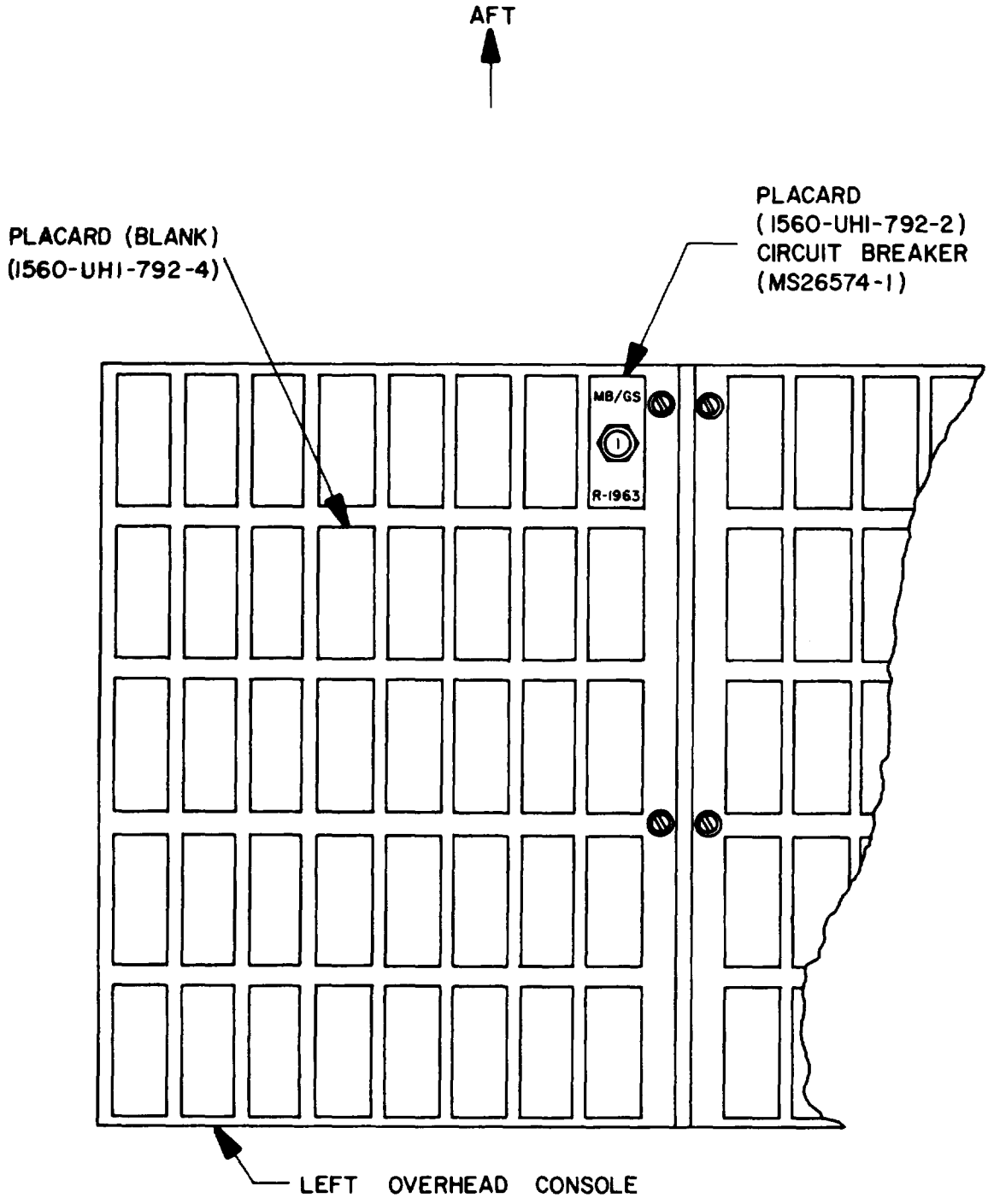


Figure 8. R1963/ARN Circuit Breaker Location

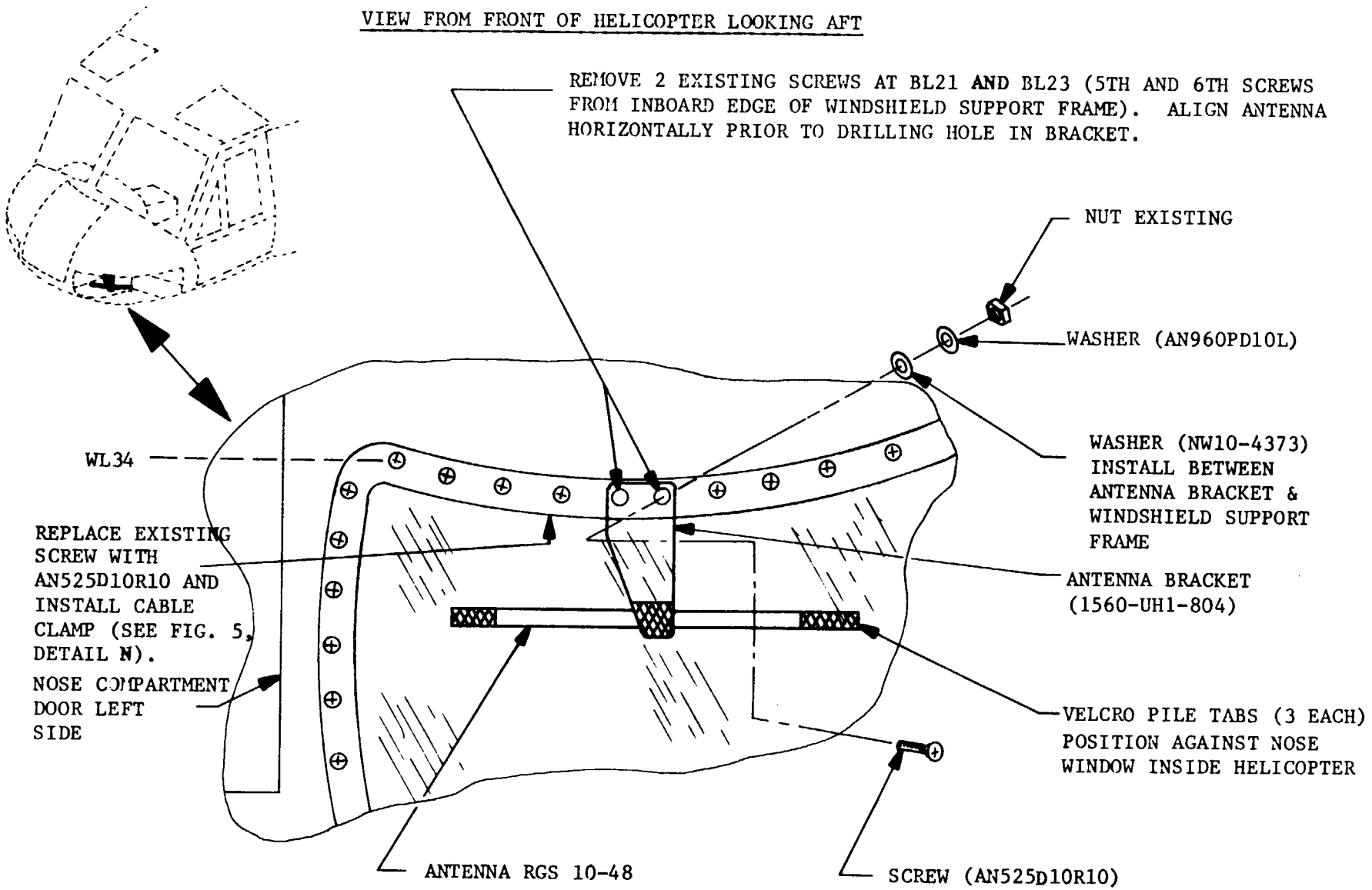


Figure 9. Installation of Glideslope Antenna Assembly (1560-UH1-805)

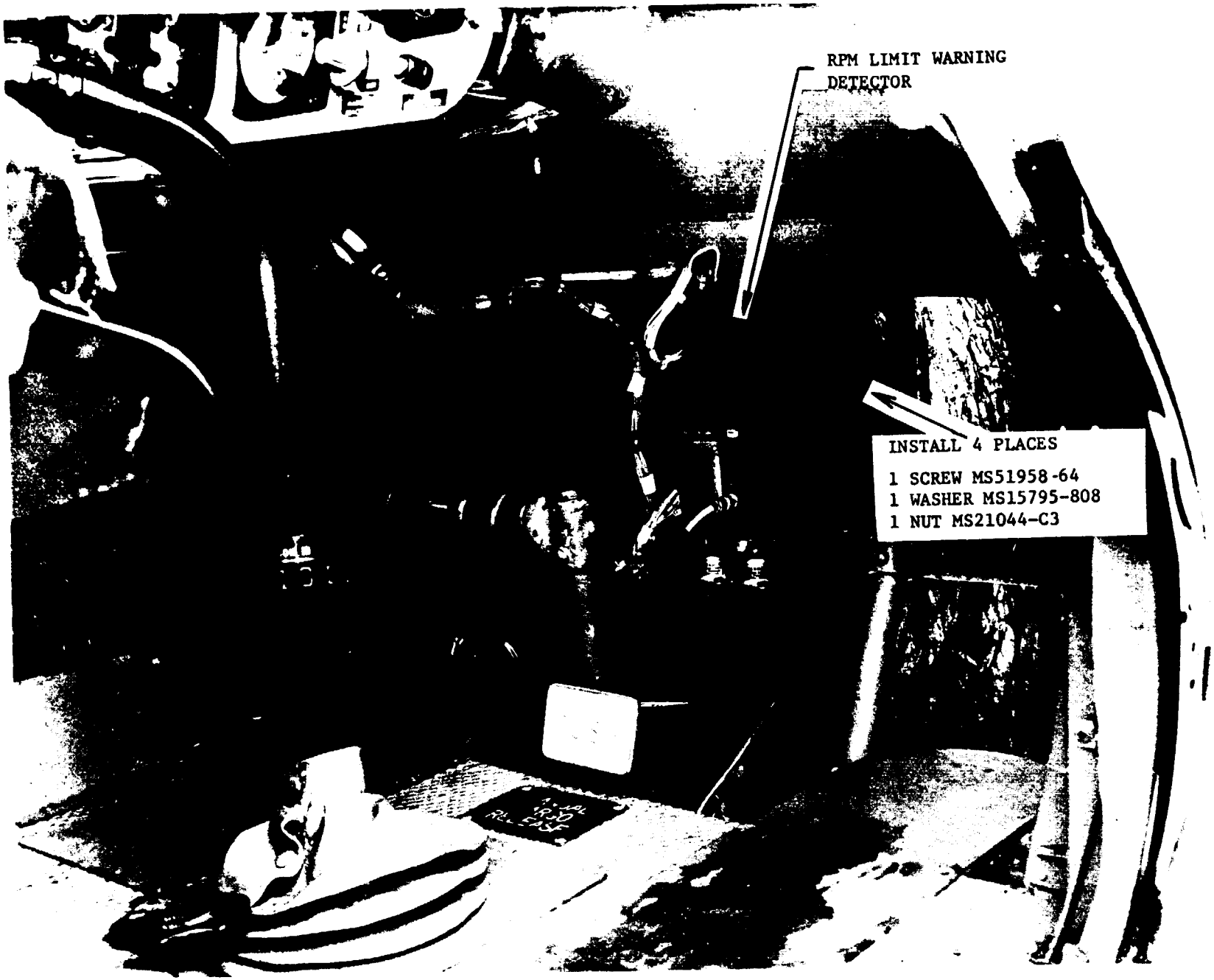


Figure 10. Mounting Bracket Assembly with Equipment Installed

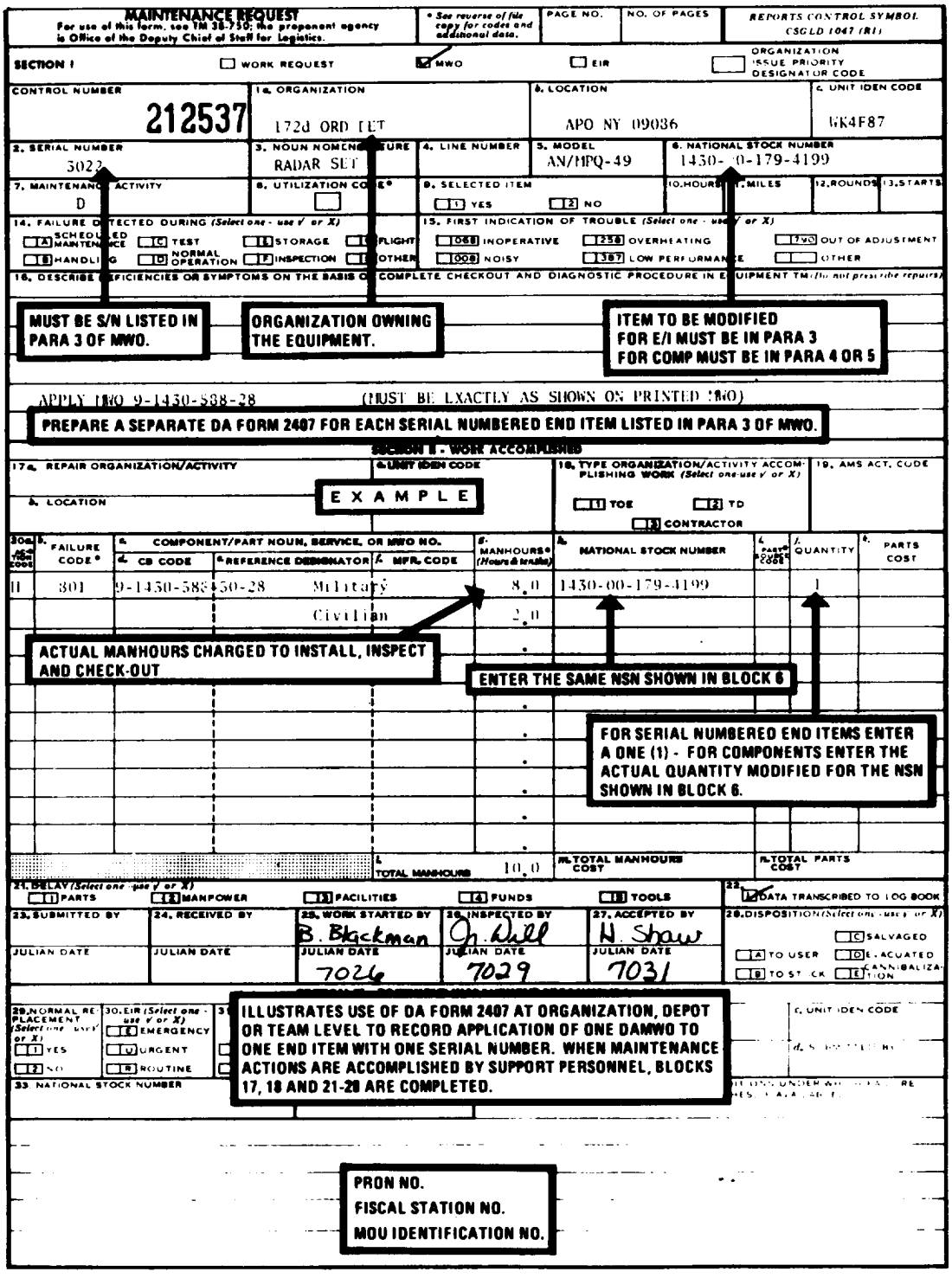


Figure 11. Maintenance Request Single MWO to Single Item of Equipment

This manual is published for the use of all concerned.

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 MWO requirements for UH-1D/H aircraft.

*U.S. GOVERNMENT PRINTING OFFICE: 1980--665134/2070

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

THEN. . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
CoA, 3d ENGINEER BN
FT. LEONARD WOOD MO 63108

DATE 16 DEC 74

PUBLICATION NUMBER	DATE	TITLE
MWO 55-1520-210-30-45	19 Mar 80	Installation of Glideslope/ Marker Beacon Radio Receiver R-1963 ARN in UH-1D/H Helicopters

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
6	2-1 a		
81		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders

Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN

SAMPLE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE: John Doe

DA FORM 1 AUG 74 2028-2

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG DOTTED LINE

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REVERSE OF DA FORM 2028-2

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REVERSE OF DA FORM 2028-2

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers - 3,280.8 feet

Weights

1 centigram = 10 milligrams - .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 38.82 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 10 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	3.94
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton meters	1.365	metric tons	short tons	1.102
pound-inches	newton-meters	.11375			

Temperature (Exact)

°F Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 044349-008