

TYPE 93MS

SUMMARY OF DATA

PURPOSE

To provide a Beam Approach System for aircraft at Naval Air Stations. The equipment consists of three W/T beacons which radiate one horizontal and two vertical signal beams.

	<u>MAIN BEACON</u>	<u>MARKER BEACONS (OUTER & INNER)</u>									
TRANSMITTER	Patt.54174 Transmitter 7 BC (fitted in duplicate)	A.M. Type T.1440A and T.1440									
FREQUENCY	200 to 250 Mc/s (normally 246)	360 Mc/s									
POWER OUTPUT	3 watts	20 watts									
TYPE OF TRANSMISSION	C.W. modulated at R/F between 540 and 830 Kc/s. Aerial phasing switched to give transmission of interlocked A and N morse characters.	Keyed M.C.W.:- <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Marker</th> <th>Modulation</th> <th>Keying Rate</th> </tr> </thead> <tbody> <tr> <td>Outer</td> <td>700 c/s</td> <td>2 longs per sec.</td> </tr> <tr> <td>Inner</td> <td>1700 c/s</td> <td>6 shorts per sec.</td> </tr> </tbody> </table>	Marker	Modulation	Keying Rate	Outer	700 c/s	2 longs per sec.	Inner	1700 c/s	6 shorts per sec.
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Outer	700 c/s	2 longs per sec.									
Inner	1700 c/s	6 shorts per sec.									
AERIAL	Aerial Outfit AGN	A.M. Aerial System Type 191									
RANGE	8 miles at 1000 feet to 20 miles at 7000 feet.	---									
POWER INPUT REQUIRED	230V 50 c/s - 1½ kW (approx.)	230V 50 c/s - 500 watts for each marker beacon									
WAVEMETER	None - Crystal controlled transmitter.	Wavemeter incorporated in transmitter.									
CONTROL EQUIPMENT	Patt. 68952 Control Unit Design 71 (Power and Monitoring) - Input 230V, 50 c/s 150W approx.										
MAJOR UNITS											

(a) In Main Beacon Building

1. Patt.54174 Transmitter 7 BC No.1
2. Patt.54174 Transmitter 7 BC No.2
3. Patt.67962 Cabinet Assembly Design 31
4. Patt.67965 Relay Drawer
5. Patt.67966 Switch Phase Changing Drawer No.1
6. Patt.67966 Switch Phase Changing Drawer No.2
7. Patt.58759A Rectifier Unit Design 97
8. Patt.67964 Amplifier Design 9 Drawer (Visual Alarm)
9. Patt.67963 Receiver 62D Drawer

(b) On Top of Main Beacon Building

10. Aerial Outfit AGN
11. Patt.67969 Aerial Unit Design 40 (Visual Alarm)

(c) Adjacent to Main Beacon Building

12. Patt.67968 Aerial Unit Design 39 (Aural Monitor)
(Aerial Monitor) (3 in No.)

(d) Outer Marker Beacon

13. A.M. Transmitter Type T1440A
(includes Aerial System Type 191)

(e) Inner Marker Beacon

14. A.M. Transmitter Type T1440
(includes Aerial System Type 191)

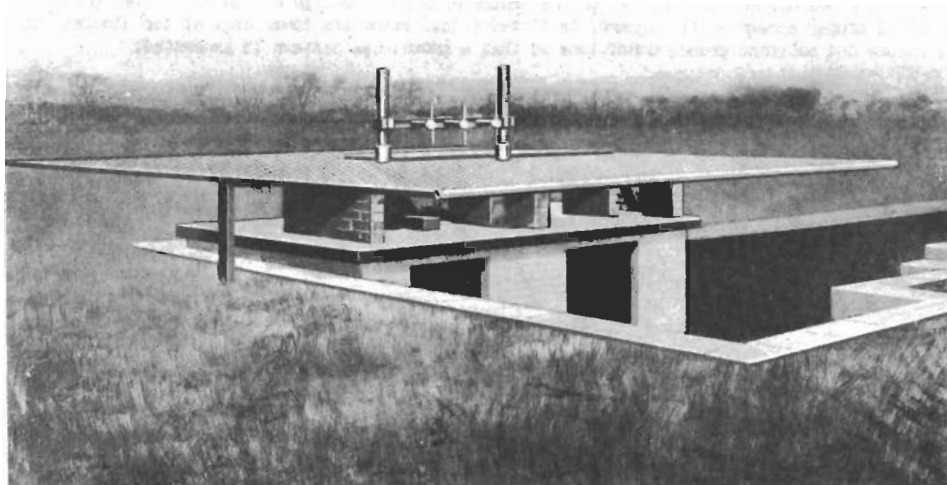
(f) In airfield Control Tower

15. Patt. 68881 Control Unit Design 77
16. Patt. 67972 Monitor Unit Design 15 (Aural)

(g) Miscellaneous

17. Patt. 68650 Monitor Unit Design 16
(Aural) Local
18. Patt.67967 Meter Unit Design 15
(Field Strength)
19. Test Oscillator Type T.S.24 /ARR-2

Note:- Item 3 contains Items 4-9
Item 15 contains item 16.



MAIN BEACON BUILDING

PHYSICAL DATA

	<u>Width</u>	<u>Depth</u>	<u>Height</u>	<u>Weight</u>
Patt. 54174 Transmitter 7 BC	19 in.	16 in.	2 ft. 9 in.	210 lb.
Patt. 67962 Cabinet Assembly Des. 31 complete with units	2 ft.	2 ft. 2 in.	3 ft. 7 in.	200 lb.
Aerial Outfit AGN	6 ft.	1 ft.	1 ft. 11 ins.	50 lb.
Control Unit Design 71	19 in.	10 in.	4 ft. 5 in.	110 lb.

BRIEF DESCRIPTION

Type 93MS is a V.H.F. W/T Beam Approach Installation which is fitted at certain Naval Air Stations to guide aircraft down on to a selected runway during conditions of poor visibility. It consists of a main interlocking signal beacon and two marker beacons. All three beacon transmitters may be switched on and off and monitored from the Airfield Control Tower.

The main beacon transmitter, sited in line with and about 600 feet from the upwind end of the runway, radiates a signal in a substantially horizontal beam directed along the runway approach path and the reciprocal direction, such that when the approaching aircraft is on the correct line of approach the pilot hears a continuous signal, whilst deviation to port or starboard is indicated by the continuous signal changing to A's and N's respectively. If the aircraft approaches the runway from the reciprocal direction it will receive A's when it deviates to starboard and N's when it deviates to port.

The two marker beacon transmitters, outer and inner, are sited on the centre line of the approach path and transmit substantially vertical beams to intersect the main (horizontal) beam. The outer marker is sited at a distance of about 9700 yards, and the inner marker about 534 yards, from the downwind end of the runway, and indicate to the pilot of an aircraft using the landing beam his distance from the end of the runway. To distinguish one marker from the other, the signal from the outer marker has a note frequency of 700 cycles per sec. and is keyed at 2 dashes per sec., while the inner marker has a note frequency of 1700 cycles per sec. and is keyed at 6 dots per sec. On hearing the outer marker the pilot will commence to lose height, and will land directly after hearing the inner marker.

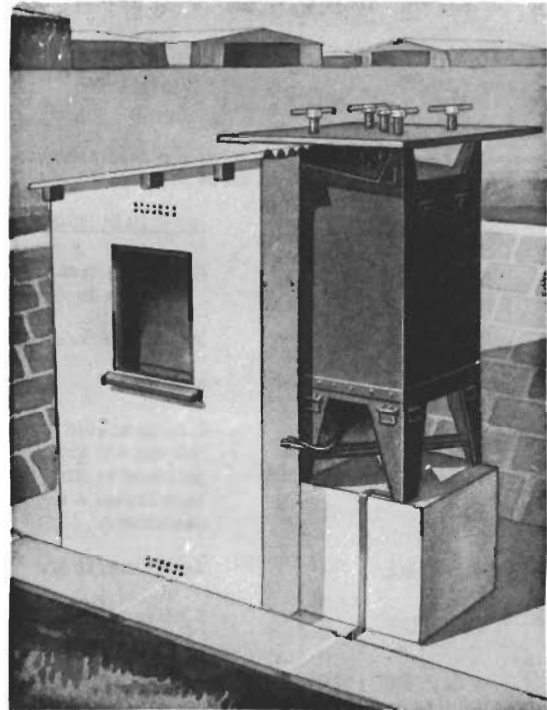
ASSOCIATED AERIAL OUTFIT

Aerial Outfit AGN which comprises:-

1. Patt. 55301A Dipole Unit Design 63 (2 in No.)
2. Patt. 55474 Support Design 4 for Dipole Units.
3. Patt. 67970 Phase Switching Unit Design 2.

The support is mounted horizontally above the roof of the main beacon building.

The dipole units are vertical folded dipoles fitted with $\frac{1}{4}$ wavelength matching stubs. They are secured, as the side dipoles, to either end of Support Design 4 and are connected by lead sheath cables to the Phase Switching Unit. The Phase Switching Unit consists of the aerial phase switching relay and a dipole similar in appearance to Dipole Unit Des. 63, which is fitted to the centre of Support Design 4. An artificial ground plane, consisting of expanded copper screen 24 ft. square, is fitted 9 ins. below the lower edge of the dipoles, in order to provide stable and constant ground conditions so that a known beam pattern is generated.



MARKER BEACON BUILDING

HANDBOOK

B.R. 1832(1)(2)

ESTABLISHMENT LISTS

E 1021 (Type 93MS) E 1020 (Aerial Outfit AGN)

INSTALLATION SPECIFICATION

B467