

## Operation Deep Freeze



### The Weather Picket Ships

As part of the International Geophysical Year and subsequent to, scientific research in Antarctica became a permanent operation. The United States used mainly aircraft for transportation during Operation Deep Freeze between Christchurch and McMurdo Sound. This meant that aircraft had to fly over the 4000km route with practically no weather information available to them. The US Navy decided to station weather picket ships 700km south of Campbell Island at 60 South, 160 East (midway between New Zealand and Antarctica) to provide:

- Weather and upper air conditions, for aircraft flying between Christchurch and McMurdo Station.
- TACAN (Tactical Air Navigation) - navigation beacons for these aircraft.
- Search and rescue operations in case of aircraft emergencies.
- Deliver and collect mail and supplies at Campbell Island, a sub-Antarctic New Zealand weather station.

The Edsall class destroyer escort, radar picket ships (DERs) were chosen to perform this task as they had been completely modified for this role in the 1950's. Upgraded communications, radars and navigation equipment were installed on approximately 34 ships out of the original class of 85 (DEs), including a high freeboard. The first two picket ships on station, USS Brough and USS Peterson were not completely modified.



**USS Brough 1951**



**USS Brough 1956 – thicker foremast and updated radars**



**USS Peterson**



**USS Mills**

**The completely modified DERs as shown on USS Mills, had radar updates and a high freeboard.**

**On the foremast at the top is the AN/SPS-28 Air Search Radar. Below that is the AN/SPS-10 Surface Search Radar.**

**On the mainmast at the top is the TACAN and housed in the domes below that are the Passive ECM units.**

**The AN/SPS-8 - Height Finding Radar was installed on the superstructure aft of the mainmast.**



**AN/SPS-8 – this radar “nodded” up and down**

**USS Hissem also had a discone caged HF antenna on the quarterdeck. Known as the Discage in the USN, this type of antenna is broadband and omnidirectional.**

**The discage structure consists of two truncated wire rope cones attached base-to-base and supported by a central mast. The lower portion of the structure operates as a cage monopole for the 4 – 12 MHz range. The upper portion operates as a discone radiator in the 10 – 30 MHz range. Matching networks limit the VSWR to not greater than 3:1 at each feed point.**



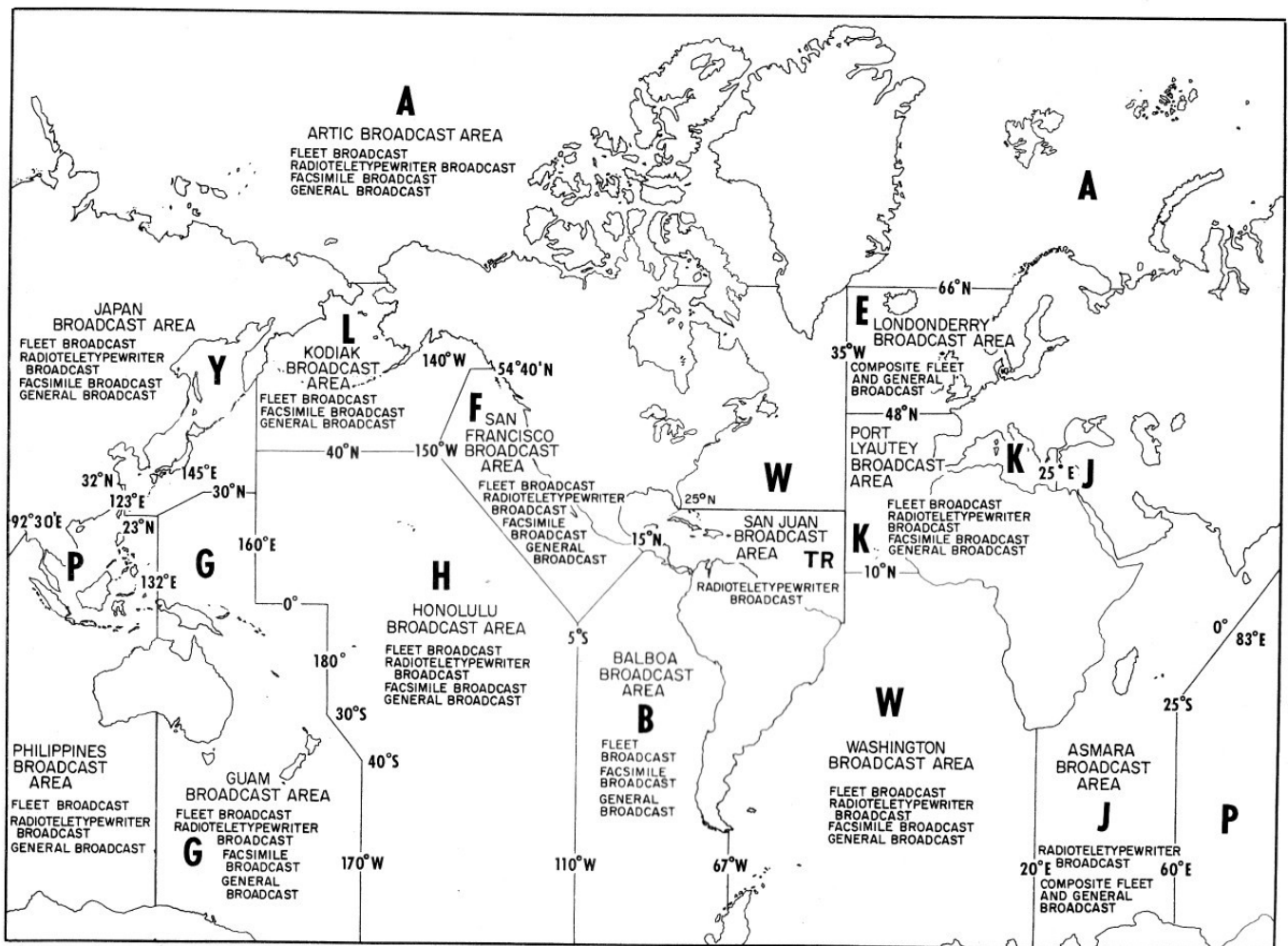
**Discage antenna shown on the foc'sle of a US Battleship.**

**The main HF transmitter on the DERs was the AN/URC-32 – the same as carried on HMNZS Endeavour II but did not have the 1 kW amplifier and were limited to 500W output.**

**The picket ships communicated weather and atmospheric data directly back to Deep Freeze Headquarters in Harewood, Christchurch.**

Communications between NZ and McMurdo were initially carried out between HMNZS Irirangi (ZLO) and McMurdo Station (NGD) in 1958 but not long after the US Navy took over this role from Christchurch using their own equipment and antennas. The receive aerials were located at Harewood and a large rhombic for transmitting at the RNZAF aerial farm at Weedons, south of Christchurch.

The US picket ships may have used Christchurch for ship/shore/ship but they also had three stations in the USN Communications System that they could use – Guam, Honolulu and Balboa (Panama), as well as the RNZN facilities at Wellington and Waiouru.



US Navy Communications System early 60's

**Operation Deep Freeze flights took place during the summer months and the picket ships were based in Dunedin during these periods, sailing to and from their 60S destination, remaining on station there for 10-12 days. They encountered rough seas, constant snowstorms, freezing temperatures and icing-up on the upper decks.**



**HMNZS Rotoiti**

**In September 1961, USS Vance took a party of scientists to Campbell Island and took a severe beating in a gale which caused several thousand dollars of damage. USS Vance returned to Dunedin for repairs and relief was provided by HMNZS Rotoiti in October that same year. She too encountered heavy seas – made worse by those who had to watchkeep on the open bridge. HMNZ Ships Rotoiti and Pukaki both participated as weather picket ships between 1961 and 1965 and the hazardous and rough conditions contributed to their early decommissioning from the RNZN.**

**The two Loch Class frigates only had DSB equipment which was not suitable for communicating with Christchurch or aircraft in transit. The US Navy lent them a Collins KWM-2A HF SSB Transceiver. The KWM-2 was an amateur radio set but the 2A was a modified set for MARS and military use allowing extra crystals to be used outside of the amateur bands. 175 Watts PEP SSB.**



### **HMNZS Pukaki**

**HMNZS Otago was sent south of Campbell Island late June 1964 with HMNZS Pukaki as back-up to carry out urgent picket duty for an American aircraft making an emergency flight to the Antarctic.**



**In late May 1966, one of the wintering over staff at McMurdo Station developed appendicitis and a USN Hercules was going to fly from Christchurch to pick him up. HMNZS Taranaki was at the time searching for the wreck of the Kaitawa off North Cape – she was diverted at all speed to proceed to Dunedin in preparation for taking up picket duty at 60S. Having taken on fuel, stores and cold weather clothing (brought down by a RNZAF Hercules), Taranaki sailed from Dunedin and took up her station at 60S to carry out her duty as weather picket.**



**HMNZS Taranaki**

**The American sailors found Dunedin charming and hospitable. The crews took on local sports teams, including cricket, went hunting and fishing, entertained children at Christmas functions and quite a few of the servicemen married local women. After their tours of duty, a few of those that married local women, even came back and settled in Dunedin with their wives.**

## Weather Picket Ships

### USN

Ship	Callsign	Pennant No
USS Brough	NDRN	DER148
USS Calcaterra	NHVB	DER390
USS Durant	NHGJ	DER389
USS Forster	NTEH	DER334
USS Hissem	NHVM	DER400
USS Mills	NJUT	DER383
USS Peterson	NQES	DER152
USS Thomas J Gary	NTJG	DER326
USS Wilhoite	NTHU	DER397
USS Vance	NTHE	DER387

### RNZN

HMNZS Otago	ZMSI	F111
HMNZS Rotoiti	ZMXK	F625
HMNZS Taranaki	ZMKF	F148
HMNZS Pukaki	ZMXD	F424



USS Forster

## Weather Picket Dates

Ship	Arrived Dunedin	Departed Dunedin
Brough	03/10/56	04/03/57
	25/09/57	01/03/58
	20/09/58	07/02/59
Peterson	22/09/59	22/02/60
Wilhoite	23/09/60	? Feb 61
Vance	10/09/61	? Mar 62
Rotoiti	? Oct 61	? 62      3 patrols
	Late 62	Late 62      2 patrols
	Late 63	Late 63      2 patrols
Durant	06/09/62	30/01/63
Forster	14/01/63	08/03/63
Hissem	18/09/63	28/02/64
Pukaki	? Jan 64	? Feb 65      5 patrols
Mills	22/09/64	07/03/65
	03/10/66	07/03/67
	02/10/67	07/03/68
Calcaterra	20/09/65	10/02/66
	23/09/67	25/02/68
Thomas J Gary	16/10/65	03/03/66
	26/09/66	15/02/67

With the departure of US Ships Mills and Calcaterra in 1968 and the introduction of satellite navigation, the need for weather picket ships was no longer required. The relationship between the US Navy Pickets and the City of Dunedin had come to an end.